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ABSTRACT

The study investigated intrapersonal and interpersonal behaviors and events in self-injurious disabled persons (2-22 years old). The study involved four components: (1) a survey of 82 Ss using the self-injurious behavior (SIB) Perception Questionnaire, Antecedent/Consequent Card Sort, and the American Association on Mental Deficiency Adaptive Behavior Scale; (2) a cognitive assessment by 43 Ss using Piagetian based and standarized assessment; (3) standard activities (N=48) of easy, difficult, preferred, nonpreferred tasks; and (4) naturalistic observations (N=8) for 4 consecutive days within classroom settings. Survey findings revealed increasing SIB frequency and number of topograhies at successive age group and rate group levels, a prototypic profile of 11 classes of antecedents to SIB along with individual variations in profiles, and increased adaptive behavior skills with age but decreased standing relative to institutional norms. Based on assessments, 70% of Ss were functioning within the sensorimotor and 30% within the preoperational period of cognitive development. During standard activities, negative/manipulative and task behaviors covaried with task condition, and non-SIB negative behavior decreased while SIB and task compliance increased with age. Naturalistic observations revealed individual antecedent/consequence patterns. Questionnaire results generally were consistent with observational findings. (Author/CL)

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THE RELATIONSHIP OF SELF-INJURIOUS BEHAVIOR TO AGE, COGNITIVE FUNCTIONING, AND INTRAPERSONAL AND INTERPERSONAL BEHAVIORS AND EVENTS: A NATURALISTIC STUDY OF DEVELOPMENTALLY DELAYED CHILDREN

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October 1982

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education

Bureau of Education for the Handicapped

ABSTRACT

The present research investigated intrapersonal and interpersonal behaviors and events in self-injurious individuals, ages 2 - 22 years, who were served by community programs in three central Ohio counties. Components of the study were: Part I Survey (N = 82), utilizing the Self-Injurious Behavior (SIB) Perception Questionnaire, Antecedent/Consequent Card Sort, and A.A.M.D. Adaptive Behavior Scale; Part II Cognitive Assessment (N = 43) with Piagetian-based and standardized measures; Part III Standard Activities (N = 48) of easy, difficult, preferred, nonpreferred tasks; and Part IV Naturalistic Observation (N = 8) for four consecutive days within classroom settings. Survey findings revealed increasing SIB frequency and number of topographies at successive age group and rate group levels, a prototypic profile of 11 classes of antecedents to SIB along with individual variations in profiles, and increased adaptive behavior skills with age but decreased standing relative to institutional norms. Based on assessments, 70% of children were functioning within the sensori-motor and 30% within the preoperational period of cognitive development. During standard activities, negative/manipulative and task behaviors covaried with task condition, and non-SIB negative behavior decreased while SIB and task compliance increased with age. Naturalistic observations revealed individual antecedent/consequent patterns. And, finally, questionnaire results generally were consistent with observational findings.

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October, 1982

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INTRODUCTION

Until recently, literature on self-injurious behavior (SIB) was restricted to surveys on prevalence and correlated behaviors, single subject studies reporting the efficacy of diverse intervention strategies, and theoretical papers addressing the etiology and operant functions or motivational aspects of SIB. Pediatric surveys, among the earliest surveys reported, indicated that headbanging occurs in from 3.6% to 17% of normal children, with average age of onset at 8 or 9 months of age, greatest frequency between 9 and 18 months of age, and disappearance of SIB by 25 to 36 months of age. Although SIB has been observed in from 7.7% to 14% of institutionalized retarded populations, 60% of autistic children with IQs $\leq$ 69, and up to 40% of institutionalized schizophrenic children, more severely and profoundly retarded persons evidence SIB with higher frequency and greater severity and chronicity than the moderately or mildly retarded. Further, higher functioning persons engaging in SIB (SIBers) tend to exhibit milder and fewer SIB topographies than lower functioning SIBers. (See Baumeister & Rollings, 1976, and Schroeder, Mulick, and Rojahn, 1980, for summaries of survey findings.)

Correlates of SIB in the retarded, institutionalized population have included organic dysfunction, aggression, and little or no expressive language. Frankel and Simmons (1976) suggested that SIBers may be deficient in adaptive behavior, whereas Schroeder, Schroeder, Rojahn, and Mulick (1981) have aptly noted that although skill building of communicative behaviors is important in providing alternative behaviors to SIB, it is not sufficient to suppress SIB. Aggression toward others, destruction of property, and SIB have also been observed in the deaf, institutionalized retarded (Talkington & Hall, 1969) and in children exhibiting Stage VI sensori-motor behaviors but who have no speech (Gould, 1976).

Most common topographies identified by Schroeder et al. (1981) through review of published studies and surveys are, from most prevalent to least, headbanging (including face hitting), biting, scratching, hairpulling, gouging and pinching; the most frequent combination is headbanging and biting, with at least 9% of subjects exhibiting three or more behaviors. To date, topography has not been found to be related to preferred intervention or to success of intervention. However, symptom substitution or changes in topography have been reported with all interventions in use.

Interventions applied to SIB have included punishment (slapping, electric stimulation, aromatic ammonia), overcorrection (positive practice and restitutive), timeout (brief attention withdrawal, contingent removal from situation, noncontingent isolation), extinction, restraint (noncontingent, contingent on SIB, contingent on non-SIB), and differential reinforcement (of other-DRO, alternative-DRA, and incompatible-DRI behaviors), as well as various combinations of these procedures. All interventions have proven to be person and setting specific with planned programming for generalization needed. Punishment has been the most rapid suppressor with effectiveness influenced by availability of alternative behaviors; DRO has proven less effective than DRI or DRA, although results conflict as to the necessity for incompatible over alternate behaviors; efficacy of timeout has been related to some degree to length of timeout and to reinforcing value of timein. (See Harris & Ersner-Hershfield, 1978, for review.) Success of most interventions is influenced by the apparent function of the SIB (Gaylord-Ross, Note 1).

Hypothesized functions or motivational aspects have included escape, avoidance, discriminative cue for reinforcement, frustration, and homeostatic regulation (Carr, 1977). With the exception of two syndromes, Lesch-Nyhan and Cornelia de Lange (the latter questioned by this author), no specific organic etiology has been identified for SIB.

Ecobehavioral Approach

With the advent of the ecobehavioral approach to SIB, the more simplistic response-consequent research is being replaced with interest in a complex of additional situational variables and their interrelationship with SIB and non-self-injurious behaviors. Conditions and events antecedent to SIB which have been studied to date include mands (Carr, Newsom, & Binkoff, 1976), high error rate (Weeks, 198_), task preference (Gaylord-Ross, Weeks, & Lipner, 1980), and ordering of activities (Schroeder & Humphrey, Note 2). The interaction among interpersonal, intrapersonal, and intervention factors is being studied more closely, including the effects of different kinds of restraints, i.e., camisole, fencing mask, T-shirt, jumpsuit, on frequency of adult social interactions with subjects as well as on changes in SIB topography (Rojahn, Mulick, McCoy, & Schroeder, 1978; Rojahn, Schroeder, & Mulick, 1980). Wahler's work (Kara & Wahler, 1977) on response covariation has sparked interest in SIB as related to response classes and hierarchies within classes, although specific research with SIB subjects is limited. Most recently Schroeder et al. (1980) have questioned the value of rate or average "frequency" as the best measure for studying SIB and have suggested that attention be paid to spatial and temporal aspects of SIB, including duration of SIB "runs." And, finally, the importance of analyzing sequences of events relative to SIB has been acknowledged although not yet implemented.

Developmental Perspective

Missing from the ecobehavioral approach is the developmental perspective which considers the maturational variable in conjunction with environmental factors. Developmental hypotheses have been limited to viewing SIB as: 1) resulting from abnormal rearing conditions in infancy involving mother-infant separation and institutionalization; 2) normal motor activity, which along with other rhythmic habit behaviors, furthers the infant's growth and may co-occur with bodily pain, such as during teething; 3) primary or secondary circular motor movements, which although adaptive at onset have persisted in some retarded individuals (Baumeister & Rollings, 1976). However, various researchers have acknowledged the importance of studying the onset and subsequent development of SIB in retarded individuals. A first attempt in this direction is Evans' work (Note 3) which proposes to study the development of "excess" behaviors in young multihandicapped children, although in relationship to skill behaviors as opposed to developmental functioning level.

Whether the developmental perspective can add to our understanding of persons who engage in SIB remains to be demonstrated. However, some areas worth exploring from a developmental viewpoint include profiles of cognitive functioning, social/communicative and aggressive behavior, and antecedents to SIB.

Application of the Piagetian based Uzgiris and Hunt Sensorimotor Assessment (1975) to the mentally retarded has demonstrated ordinality of the scales for young and adolescent retarded children (Weisz & Zigler, 1980).

However, different rates of development for subgroups of mentally retarded children have been observed (e.g., Wohlheuter & Sindberg, 1975, with the object permanence subscale) as well as different patterns of subscale clusters (Dunst, Note 4). It is unlikely that the entire SIB population, given ranges of functioning level from sensori-motor through preoperational, will show similar cognitive profiles. However, it may be possible to demonstrate a minimum cognitive level at which SIB occurs (e.g., sensori-motor Stage III), subscale clusters associated with severe SIBers, and/or correlations of SIB severity, multiplicity of topographies, and frequency with cognitive functioning level.

Rather than viewing SIBers as globally deficient in communicative behaviors and generally in need of training in alternative communicative behaviors, it might be more fruitful to ascertain what communicative behaviors SIBers do exhibit, whether these behaviors reflect their cognitive functioning level in terms of sophistication, frequency, and generalization of response, and, if deficient, what behaviors would be developmentally appropriate to program. The work of Bates (1976), Carter (1978), and Sugarman-Bell (1978) provides a theoretical and normative base for construction of a pre-verbal communicative scale, while the research of Bricker and Carlson (Note 5) and Dunst (Note 6) provides beginning replication and application of the sequence to the young mentally retarded population. In studying the aggressive behaviors of SIBers, negative and manipulative behaviors might be analyzed similarly.

Further, in their discussion of stimulus overselectivity, Lovaas, Schreibman, and Koegel (1979) have noted the possibility that a developmental function exists relative to stimulus selection as cues governing response. That antecedents to SIB might be related to cognitive functioning level has not yet been explored. The possibility that types of cues, aspects of given situations perceived as cues, anticipatory components of cue interpretation, as well as number or instability of cues serving as antecedents to SIB might be developmentally sequenced is an intriguing thought.

In summary, given increasing interest in ecobehavioral assessment and attention to interaction of multiple interpersonal and intrapersonel variables, the marriage of the developmental perspective and the ecobehavioral approach and technology seems timely.

Problem, Goals, and Objectives

Although attention has shifted to naturalistic descriptive research, study of ecobehavioral variables and multiple subject or group designs, many issues have not been addressed or resolved by either the earlier or this more recent research. Specifically, surveys of individuals engaging in SIB have been carried out primarily with institutionalized populations. As a result, little is known regarding characteristics of community residents or of young developmentally delayed children who engage in SIB. Further, more exacting information is needed concerning those characteristics previously identified; e.g., low intellectual functioning level, deficits in communicative skills, and presence of aggressive behaviors.

Study of selected ecobehavioral variables has led to theoretical papers and suggested guidelines for analysis of intra- and interpersonal factors and subsequent choice of treatment. However, no systematic information upon which to base analyses and treatment decisions has been gathered regarding multiple antecedents to or functions of SIB within and across individuals as evidenced in the natural environment. Although the importance of studying spatial and temporal aspects of SIB has been acknowledged, this has not been utilized to document the shaping, maintenance, or suppression of SIB as it occurs. In addition the sequences of events and behaviors preceding and following SIB have not been explored.

The past research with single subject studies and more recent group studies which do not control for age or chronicity of behavior leave unanswered questions regarding the relationship of age to changes in parameters of SIB in the retarded population. And, finally, the possible interrelationship of developmental functioning level, i.e., cognitive profile(s), with each of the previously mentioned variables has never been researched.

Hence, the overall purpose of this study was to further our understanding of SIB in children who reside in the community, of the interrelationship of intrapersonal and interpersonal behavior and events with SIB, and of similarities and differences in SIB and associated behaviors relative to age and cognitive functioning levels. Specifically, the relationship of age and cognitive functioning level to parameters of SIB, social/communicative and negative/manipulative behaviors, antecedents and functions of SIB, and sequences of these behaviors and/or events were investigated in a large group of children, ages 2-22 years, who reside in the community and engage in SIB.

In order to accommodate these multiple facets, the study comprised four primary components:

Part I: Survey of SIBers residing in the community;

Part II: Cognitive assessment of SIBers;

Part III: Group study of SIBers with standard series of activities;

Part IV: Indepth observation of SIBers in the natural environment.

Part I: Survey

Given that little is known regarding individuals engaging in SIB who reside in the community, the first component was intended to further our understanding of characteristics of SIBers, ages 2-22 years, who reside in the community in several counties in Ohio in relation to:

1. prevalence of SIB;
2. parameters of SIB, e.g., age of onset, frequency, topography, and severity;
3. antecedents to SIB; and
4. correlated characteristics; e.g., etiology and/or diagnosis, sensory and physical impairments, presence and severity of maladaptive behaviors, and level of adaptive behaviors.

The information collected enabled comparison of this population with previously reported findings with institutionalized persons.

Additionally, conditions currently maintaining SIB cannot be presumed to be identical with those resulting in initial onset or in subsequent shaping and increasing of SIB. Similarly, initial frequencies and topographies cannot be assumed to be identical with subsequent frequencies and behaviors observed. Therefore, similarities and differences in the form and frequency of SIB and in correlated characteristics within and between age groups (2-6 years, 7-11 years, and 12-22 years) were explored.

Part II: Cognitive Assessment of SIBers

Although surveys provide summary information regarding correlates of SIB, they fail to provide more exact information on the behaviors in question. It has been suggested that profiles of retarded individuals in cognitive functioning differ from those of normal infants and that several prototypic profiles exist within the retarded population.

Therefore, the second component examined in more depth the intellectual functioning of the individuals identified in Part I in order to ascertain possible profile types and their correlates within the SIB population. More specifically, information on cognitive functioning enabled investigation of cognitive profiles as related to form and frequency of SIB, antecedents and consequents responded to by emission or cessation of SIB, and social/communicative and negative/manipulative behaviors exhibited (variables studied further in Parts III and IV).

Part III: Standard Series of Activities

Whereas survey information will provide insights into adults' perceptions of SIB, more systematic data are needed within and across individuals regarding antecedents to SIB, functions of SIB, temporal and spatial patterns of SIB, and sequences of events preceding and following SIB. At present such information exists only for selected individuals relative to a few antecedents or interventions. Further, although past surveys have shown (and possibly the present survey will confirm) that SIB is engaged in primarily by severely and profoundly retarded individuals who also exhibit lower communicative skills and more aggressive behaviors than non-SIBers, more specific information regarding the nature of these behaviors, their relationship with developmental functioning level, and their occurrence in relation to SIB and environmental events is needed.

Part III attempted to elucidate relationships among the aforementioned variables through administration of specially designed tasks and situations which correspond to major conditions, events, and behaviors thought to constitute antecedents to SIB in the natural environment. An observational coding system, utilizing sequential recording, was developed to target the probable range of SIB antecedents, the parameters of SIB, the major categories of negative manipulative behaviors, and developmentally sequenced social/communicative behaviors. The use of the standard activities provided controlled conditions through which children's behavior could be observed, recorded, and subsequently analyzed relative to their age and cognitive functioning (identified in Part II) in order to answer questions regarding:

1. the range of antecedents to and functions of SIB within and across individuals;
2. the types of antecedents and functions which may be related to cognitive functioning level;
3. temporal and spatial patterns of SIB preceding, within, between, and across tasks and situations;
4. patterns and functions observed which may indicate that SIB is being suppressed, maintained, or increased;
5. the kinds and frequency of social/communicative and negative/ manipulative behaviors engaged in; and
6. the existence of characteristic sequences of behaviors and events antecedent and subsequent to SIB.

Part IV: Naturalistic Observation

The fourth component investigated the generalizability of survey and standard task findings to SIB as it occurred within the natural environment; i.e., determined whether behaviors reported by teachers and/or observed in controlled situations, in fact, did occur similarly in the natural environments. The observational coding system devised for Part III was utilized with similar analyses performed.

REVIEW OF LITERATURE

Most of what is known today regarding the characteristics and treatment of self-injurious behavior has been acquired through surveys and single subject studies implemented within the past 20 years. Surveys of the prevalence of SIB were first undertaken in the 1960s for infant and psychiatric populations. Information concerning the parameters of SIB and associated characteristics of SIBers has been generated by surveys of institutionalized retarded populations. Working primarily with institutionalized individuals, investigators have demonstrated suppression of SIB with a variety of techniques derived from the operant paradigm. These studies supply indirect proof and disproof for hypotheses of the function of SIB. Most recently, interest has broadened to include the relationship of antecedent conditions and events with SIB. In the following section, relevant literature in each of the above areas is reviewed. In addition, related research which is potentially applicable to the study of SIB is presented.

Prevalence of SIB

Normal Infants and Young Children

Initial surveys were concerned with the prevalence, onset, and demise of SIB in young children. The earliest topography noted has been face scratching accompanying windmill-like arm movements during crying at 3 months of age, followed by rhythmic thigh hitting during crying at 7 months (Mittleman, 1954, as reported by Green, 1967). Considerably greater attention has focused on headbanging, with average age of onset reported as 8 months (range 5 months to later than 12 months) and as co-occurring with teething (Kravitz, Rosenthal, Teplitz, Murphy, & Lesser, 1960) or otitis media (DeLissovoy, 1961). In both studies, average duration of headbanging was 17 months with cessation by about 3 years of age.

Additional information obtained by Shentoub and Soulairec (1961) on 300 toddlers and preschoolers, ages 9 months to 6 years, revealed that various topographies of SIB were present in from 11-17% of 9 to 18 month olds, 9% of 2 year olds, 4-5% of 3 to 4 year olds, and 0% of 5 year olds. Also, after 18 months of age, SIB often was replaced by increased aggression toward persons and objects.

Special Populations

Highest prevalence of SIB has been reported among schizophrenic and autistic children. In his retrospective study of 5 to 12 year olds, hospitalized from 1953 to 1963 and diagnosed as schizophrenic, Green (1967) identified 40% as having engaged in SIB. Similarly, Bartak and Rutter (1976) found that 50% of autistic boys under 11 years of age and enrolled in special or community programs had exhibited SIB at some time in the past. This figure is supported by Ando and Yoshimura's (1979) identification of 43% of 6 to 14 year old autistic children exhibiting some form of SIB.

Institutionalized Retarded Populations

Within the past decade, attention has shifted to prevalence of SIB among the institutionalized retarded. Estimates of prevalence range from 7.7 to 23% with Smeets (1971) identifying 35 of 400 residents as SIBers, Maisto and Baumeister (cited in Baumeister and Rollings, 1976) reporting SIB in 182 out of 1300 residents, and Ross (1972) finding 23% of residents in all California state institutions engaging in daily to as little as monthly SIB. In the only longitudinal survey available, Schroeder, Schroeder, Smith, and Dalldorf (1978c) found an average of 10% of an institutional population engaging in SIB. However, not all residents were re-referred for each of three successive surveys, suggesting that spontaneous remission may occur among some SIBers.

Community Retarded Populations

To date, no systematic surveys have been undertaken to identify prevalence of SIB in noninstitutionalized, retarded individuals. As preface to the only study employing a large group of school age and community-based SIBers (N=22), Gaylord-Ross (Note 1) stated:

> Since the project attempted to work with approximately 20-30 self-injurious children over the two year funding period, a sample of this size could probably only be identified in a large metropolitan area like New York City. (p. 4).

This assertion seems premature given the present paucity of information as well as the current dual thrust toward deinstitutionalization and increasing service to community-based, developmentally delayed individuals.

Parameters of SIB

Frequency of SIB

Information concerning frequency of SIB is available from general criteria utilized by surveys to categorize severity of SIB in institutional populations. Ross (1972), in the largest study to date, reported SIB exhibited monthly by 5%, weekly by 6%, and daily by 12% of residents.

Defining mild SIBers as ceasing SIB when told to stop and severe SIBers as continuing SIB despite admonishments, Smeets (1971) categorized 57% of his subjects as severe and 43% as mild SIBers. Finally, Schroeder et al. (1978c) reported only 23% of SIBers as severe and 77% as mild, utilizing the dual criteria of frequency (at least once a day) and physical injury (bleeding, bruising, and other injuries requiring medical intervention).

Topography of SIB

More complete information has been reported on topography of SIB than for SIB frequency. Within his sample of 35 SIBers, Smeets (1971) identified the following topographies: bite self (66% of subjects), head bang (57%), pinch self (46%), scratch self (26%), face slap (23%), and other SIB (7%). In addition, severe SIBers engaged in more different topographies (mean=3.0) than mild SIBers (2.1).

The most comprehensive information concerning topographies exhibited within and across individuals has been compiled by Schroeder and his colleagues for 186 SIBers identified in their longitudinal survey (1978c) and for 120 SIBers reported in 70 single subject studies (1981). Similar distributions were obtained for both groups relative to number of different topographies engaged in and types of topographies observed. Single topographies were exhibited by 49% and 48%, two topographies by 27% and 20%, and three or more topographies by 24% of survey and 33% of intervention study subjects. In addition, single topographies reported from most to least in both populations were headbanging, biting self, scratching self, gouging self, and hairpulling. Unfortunately, the term "headbanging" included all forms of self hitting (headbanging, face hitting, and hitting other body parts), and the category of multiple topographies (three or more SIB) reflected SIB in conjunction with self-directed behaviors (rumination, etc.).

Associated Characteristics of SIBers

Sex

Conflicting findings have been reported for the relationship of sex and SIB. Surveys of normal infants and schizophrenic children report SIB more frequently by males than by females (approximately 3:1) with SIB more severe among schizophrenic females than males. These findings are consistent with the percentage of males (70%) reported for the retarded population in general (Robinson & Robinson, 1976). However, both Whitney as well as Maisto and Baumeister (cited in Baumeister and Rollings, 1976) obtained the opposite results (SIB more frequent in females but more severe in males), and Schroeder et al. (1978c, 1981) found equal numbers of females and males in their survey and literature review populations.

Age

In general, the average age of SIBers identified through institutional surveys has been within the early 20s, whereas the mean age of subjects in intervention studies is 15 years (Schroeder et al., 1981). In addition, SIBers have been younger and institutionalized longer than nonSIBers, and severe SIBers have engaged in SIB twice as long as mild SIBers (mean=11.6 and 6.8 years, respectively; Schroeder et al., 1978c).

Intellectual Functioning

Virtually all surveys have reported SIB as more frequent among the severely and profoundly retarded than among the mildly and moderately delayed. Specifically, Ross (1972) reported SIB on a daily basis by 15% of profound, 12% of severe, 6% of moderate, and 4% of mild individuals; and Schroeder et al. (1978c) identified 14% of severe and profound, 9% of moderate, and 2% of mild institutional retardates as SIBers. However, O'Grady and Talkington (1976) found no difference among MI levels within their population when not controlling for ambulatory status.

Studies of autistic children report similar results. Among Bartak and Rutter's (1976) subjects, 60% of children with IQs < 69 and only 33% of children with IQs ≥ 70 had histories of SIB. In fact, these authors suggest that autistic children with lower intellectual functioning are more similar to retarded children and may have a different etiology than autistic children of normal intelligence. The relationship of SIB and IQ was not confirmed for schizophrenic children studied by Green (1967) whose mean IQs were 71 for male and female SIBers and 81 and 71 for male and female non-SIBers, respectively.

Adaptive and Maladaptive Behaviors

The major adaptive behavior investigated and identified by surveys as deficient has been language development. Schroeder et al. (1978c) found significantly more receptive and expressive language delays among SIBers; and Ando and Yoshimura (1979) reported lower levels of comprehension, speech, and conversation in their autistic group (half of whom were SIBers) than in their mentally retarded group (5% of whom were SIBers).

Among maladaptive behaviors, aggressive behavior has been reported as present among SIBers (Maisto & Baumeister, 1978; Schroeder et al., 1978c, etc.). However, findings of factor analysis of the Fairview Problem Behavior Record (Ross, 1971) show the possible existence of two subgroups within the SIB population, one with and one without aggressive behavior. Within this study, both hand biting and headbanging had positive loadings on Factor II (including hyperactivity, scream, noisy), while only hand biting correlated moderately with Factor I (comprising tantrums and various aggressive behaviors toward persons and objects).

A more recent study by Fuess (Note 7), comparing ABS raw scores of high (IQ $>$ 36) and low functioning (IQ $\leq$ 36) institutionalized SIBers, provides information on a broader range of adaptive and maladaptive behaviors. Among Part I Adaptive Behavior domains, SIBers were reported to exhibit significantly fewer independent functioning, language development, numbers and time, domestic activity, self-direction, and socialization behaviors. Although no post hoc analyses are reported, these differences appear to obtain only for the higher functioning individuals, with low functioning SIBers and non-SIBers performing at similar but lower levels. Conversely, on Part II Maladaptive Behavior, SIBers exhibited significantly more behaviors than non-SIBers in the domains of withdrawal, unacceptable and eccentric habits, self-abusive behavior, hyperactive behavior, and psychological disturbances. It is of interest that domains of aggressive and rebellious behaviors did not significantly discriminate between the groups.

Physiological Correlates

Surveys have found significantly more instances of seizure activity (Schroeder et al., 1978c) and brain injury (Maisto & Baumeister, 1978) among institutionalized SIBers than non-SIBers. However, the only syndrome clearly associated with SIB is the Lesch-Nyhan syndrome, a genetic disorder involving inability to metabolize purine. Children with this syndrome are solely males, exhibit athetoid movements, and engage in verbal abuse as well as SIB. They can be distinguished from other SIBers by the compulsiveness, severity, and specificity of their SIB which causes severe damage to the oral area and fingers as a result of self-biting (Nyhan, 1976).

Although the Cornelia de Lange syndrome has also been implicated as associated with SIB, SIBers with this syndrome appear to exhibit the same topographies and under the same conditions as other SIBers (Bryson, Sakati, Nyhan, & Fish, 1971; Singh & Pulman, 1979). The extent to which SIB is related specifically to this syndrome remains to be demonstrated.

Attempts to obtain physiological measures specific to SIBers have met with variable success. Kohlenberg, Levin, and Belcher (1973) interpreted their findings of higher skin conductance levels immediately after release from restraint and during SIB than following treatment with electric shock as disproving the arousal theory of SIB. Schroeder, Peterson, Solomon, and Artley (1977) obtained variable EMG levels and idiosyncratic patterns within and between SIBers during treatment with biofeedback and relaxation. As might be expected, significantly elevated pulse, decreased sleep, and increased crying by SIBers as compared to non-SIBers also were found by Matin and Rundle (1980).

Sensory and Motor Handicaps

In a subsequent study of onset of rhythmic behaviors in infants, Kravitz and Boehm (1971) reported onset of headbanging in Down's syndrome (N=22) and cerebral palsied (N=12) infants as later than in a group of normal infants (N=200). Mean age of onset of headbanging was 10.7 months in three Down's syndrome SIBers (earliest age reported=10 months), 9.5 months in two cerebral palsied SIBers (earliest age=9 months), and 7.6 months for 14 normal infants (earliest age=5 months, 10 infants exhibiting headbanging by 7 months).

Within institutional populations, SIBers have included significantly more individuals with visual impairments (Schroeder et al., 1978c), with eye gouging reported as the most frequent topography (Maisto & Baumeister, 1978). In their analysis of the interaction of physical handicapping conditions and level of retardation, O'Grady and Talkington (1976) found SIB was present significantly more often among the ambulatory, profoundly retarded (36%) than among either the nonambulatory, profoundly retarded (15%) or severely retarded (23%). Although the prevalence of SIB within given sensory or physical handicaps has not been investigated, SIB is known to be exhibited by individuals who are hearing impaired, visually impaired, deaf-blind, and cerebral palsied (Gaylord-Ross, Note 1; Talkington & Hall, 1969).

Hypothesized Functions of SIB

Within the past five years, major reviews of hypothesized functions of SIB and related research have appeared in the literature. These include the comprehensive state-of-the-art review by Baumeister and Rollings (1976), discussion of the functions of SIB by Carr (1977), critique of recent biological formulations relative to SIB by Cataldo and Harris (1982), and review of antecedent conditions and events as determinants of SIB by Schroeder et al. (1981). Shifts in perspective across these reviews also reflect the changing focus of single subject research. Following the lead of Lovaas and his colleagues (1965, 1969) and Tate and Baroff (1966), investigators began to explore a variety of aversive techniques in the treatment of SIB. As the limitations of these techniques became apparent and ethical concerns were raised relative to their use, attention was directed to more positive forms of treatment. In addition, researchers began to move beyond the limited stimulus-response framework and to investigate the possible role of antecedent conditions and events to SIB. And, finally, with recent advances in neurotransmitter research and dissemination of vestibular stimulation theory, investigators have turned to these areas for treatment possibilities. To reflect these changing perspectives, the following sections review theoretical formulations and relevant research in each of the following areas: psychodynamic theories, developmental hypotheses, biological viewpoints, learning theory investigations, and ecological formulations.

Psychodynamic Theories

Within past years, psychodynamic theories of SIB have received little attention. Baumeister and Rollings (1976) have noted that psychodynamic viewpoints presume that SIB is a symbolic expression of intrapsychic conflict, reflecting guilt, lack of sense of self and ego boundaries, and self-directed expression of anger toward others. Early work with institutionalized infants led to the formulation that SIB was a manifestation of anaclitic depression, arising from separation from mother.

In general, learning theorists have discounted psychodynamic views of the function of SIB. In particular, they have pointed to the prevalence of this behavior within severely and profoundly retarded individuals whose functioning levels preclude symbolic thought. However, Green (1967) has indicated that the psychoanalytic theories do distinguish between pre-conflictual SIB and self-destructive behavior arising from conflicts in the more mature organism and suggest the following sequence in the acquisition of SIB within schizophrenic children:

> The earliest self-mutilative behavior and its precursor patterns are devoid of fantasy and are without conflictual significance. As the pattern of self-mutilation becomes more established, it may become secondarily invested with fantasy content and used for the solution of intrapsychic conflict. (p. 243)

Little systematic research has been generated from this framework. A notable compromise between psychodynamic and operant theory is the successful application of overt and covert desensitization and thought stopping procedures to eye poking and tongue and lip biting by a schizophrenic young adult (Cautela & Baron, 1973).

Developmental Hypotheses

Developmental hypotheses have arisen from both naturalistic observations of human infants and deprivation studies with animals. Theoretical viewpoints based on human development are: 1) rhythmic behaviors are normal, adaptive behaviors in infancy and persist in some individuals (Mitchell & Eccles, 1977); 2) stereotyped and self-injurious behaviors are, from a Piagetian perspective, sensori-motor primary and secondary actions (Stages II and III) which also persist in some individuals; and 3) self-injurious behaviors arise from early mother-infant separation (also a psychodynamic viewpoint).

Whereas these theories do little to bridge the gap between results reported in surveys of normal infants and chronic SIB observed in developmentally delayed individuals, research with animals reared in deprivation conditions are more informative. Specifically, rhesus macaque monkeys reared in isolation have been observed to develop both stereotyped and self-injurious behaviors. In addition, those monkeys initially confined to visual as well as physical isolation later engaged in more frequent SIB (hand biting by males in 55% of observation sessions and by females in 35% of sessions, reported in Cataldo & Harris, 1982). Harlow and Harlow (1971) note that SIB in the form of arm, hand, foot, or leg biting is a late appearing behavior (in the second year of life) in partially isolated monkeys and, although normally harmless, can result in "tearing limbs to pieces" under stress or threat. The age of emergence of SIB also coincides with the emergence of aggression toward others in normally developing monkeys. However, SIB has been observed within the first year of life in infant monkets placed in pits following early social group experiences (Harlow & Harlow, 1971). Levison (1970) also was able to document the precise conditions under which headbanging emerged in a rhesus monkey following release from rearing with a mother surrogate chair and concommitant visual deprivation.

The developmental hypothesis has not been extended beyond extrapolation from normal infant and animals studies. Other than institutional surveys of SIB within mental intelligence levels, little is known concerning the relationship of cognitive functioning levels and SIB or of the developmental course of SIB within individuals.

Biological Viewpoints

Based on a comprehensive review of the biological research related to SIB, Cataldo and Harris (1982) have formulated seven conclusions, which are summarized below. First, although SIB has been associated with certain syndromes (Lesch-Nyhan, Cornelia de Lange, Riley-Day), the biological cause of SIB has not been demonstrated. Of three biochemical hypotheses concerning SIB in the Lesch-Nyhan syndrome, one has been disproven (elevated uric acid levels in saliva irritating oral structures), and two remain under consideration (low levels of serotonin or of dopamine). Indirect evidence for the latter come from temporary reduction of SIB following treatment with 5-hydroxytryptophan (a serotonin precursor) and brain autopsies of three Lesch-Nyhan patients which revealed lower levels of dopamine and dopamine precursors. However, SIB in Lesch-Nyhan cases has been shown to occur in the presence of specific individuals and to be modifiable by attention withdrawal contingencies.

Second, "environmental and biological events during critical stages of development may be significantly related to the pathogenesis of self-injury" (p. 34). Invoked here are the previously reported findings of SIB following pain-related occurrences in infancy (otitis media, teething) and arising from partial and complete isolation of monkeys.

Third, increased stereotypy and SIB arising from isolation (as documented in animal studies) may be due to delays in neuronal maturation. However, the role of vestibular stimulation in the etiology and its efficacy in treatment of SIB have not been established. Reduction in SIB via vestibular stimulation have been reported by Freel (Note 8) and others. A related view, not discussed by Cataldo and Harris (1982), is that SIB in some individuals may provide sensory stimulation. Rincover and Devaney (1982) have demonstrated reduction in SIB via eliminating sensory consequences through short term use of padded protective devices; while Favell, McGimsey, and Schell (1982) replaced SIB with topographically similar self-stimulatory play with toys. Unfortunately, it is not clear that the children treated in these studies exhibited SIBs as opposed to self-stimulatory behaviors.

Fourth, excessive stimulation that is induced environmentally (by novel, uncertain, or conflicting stimuli) or biochemically (by excessive ACTH and concommitant B-endorphin release) may lead to SIB and stereotypy which, in turn, may serve as attempts to reduce arousal. Fifth, and also based on analogical findings with mice, "neurological damage associated with mental retardation may produce parasthesia [heightened peripheral, neural sensitivity] and thereby provide a constant stimulus for arousal, stereotypy, and possibly self-injury" (Cataldo & Harris, 1982, p. 35).

The last two conclusions implicate endogeneous opiates in the etiology and maintenance of SIB: That is, sixth, SIB may develop out of stereotyped activity that releases endogeneous opiates; and, seventh, SIB may be engaged in at particular intensities and rates to self-administer endogeneous opiates. Sandman, Datta, Barron-Quinn, Hochler, Williams, and Swanson (unpublished paper cited by Cataldo & Harris, 1982) found reduction in SIB by two retarded SIBers following injection with Naloxone, a synthetic analgesic which competes for opiate receptor sites in the brain. And, finally, the release of opioides during stress or pain as well as self-administration of enkephalin and B-endorphin by rats have been demonstrated.

Drug therapy, other than that cited above, has not been based on hypotheses concerning a direct relationship between neurotransmitter activity and SIB. Schroeder, Rojahn, and Mulick (1978b) have noted that studies of psychotropic drugs have been poorly controlled and none have been double blind. Their own survey (1978c) revealed that institution personnel perceived 68% of cases receiving only psychotropic medication as unimproved, whereas 94% of individuals treated with behavioral interventions had improved. Matin and Rundle (1980) recently reported promising results with lithium treatment, but did not provide any measures of change or address other variables which might also be present in these cases (e.g., behavioral treatment).

The Operant Model and Its Applications

The operant model of SIB. Frankel and Simmons (1976) have made explicit four assumptions underlying the operant model of SIB. First, SIB "may be viewed as an alternative means of obtaining adult attention" (p. 512). SIBers are presumed to lack communicative behaviors or, as with schizophrenic SIBers, to exhibit communication disorders. Although not negating the basic assumption, Schroeder et al. (1981) note that training of alternative, communicative behaviors is insufficient to suppress SIB. In addition, no evidence has been presented to support the widespread contention that SIBers exhibit no communicative behaviors.

The second assumption is that SIBers modify adult attention by "eliciting adult attention contingent upon the occurrence of [SIB]" or by reducing adult attention during high demand situations (p. 513). This corresponds to the two major hypotheses derived from operant paradigms; i.e., that SIB serves as a discriminant cue for reinforcement (rewards, usually social, are delivered immediately following SIB) and that SIB is negatively reinforced (SIB is instrumental in terminating, avoiding, or escaping aversive situations). In sum, SIB is perceived to be maintained by its (SIB's) consequences.

Initial evidence of the role of contingent social attention in accelerating SIB and of extinction as well as attention contingent on non-SIB in deccelerating SIB was provided by Lovaas and his colleagues' classic series of studies (Lovaas, Freitag, Gold, & Kassorla, 1965; Lovaas & Simmons, 1969). In addition, Lovaas et al. (1965) demonstrated that SIB may serve different functions for different individuals (social attention being positive to some children and aversive to others). Unfortunately, most subsequent researchers, in their zeal to suppress SIB, have focused almost exclusively on the differential effectiveness of interventions without regard for individual differences in the function of SIB.

Indirect evidence of differing functions across individuals is provided by Gaylord-Ross'(Note 1) demonstration of the differential effects of four treatments with 22 children; i.e., greatest response suppression was obtained with contingent restraint for 10, reinforcement withdrawal for six, DRI for five, and omission training for one child(ren). A more direct assessment of multiple functions of SIB within and across children has been reported recently by Iwata, Dorsey, Sliper, Bauman, and Richman (1982). Utilizing situations designed to correspond to different reinforcement conditions, the authors identified five patterns of SIB frequency: low SIB during unstructured play (no demands, combined with praise contingent on no SIB and delivered at least every 30 seconds), highest SIB when alone (in a room alone without adults or toys present), SIB only during academic demand situations (fine motor tasks with potential negative reinforcement via 30 second attention withdrawal contingent on each SIB), highest SIB during social attention contingent on SIB (free play with social disapproval contingent on each SIB), and high levels of SIB across all sessions.

Frankel and Simmon's (1976) third assumption is that "pain per se is not a positive reinforcer for these children ... but, rather, is part of a stimulus complex which is a conditional positive reinforcer (or, alternatively, a discriminative stimulus for positive reinforcement" (p. 513). Results of punishment studies have demonstrated that animals will tolerate increasingly painful stimuli when these are paired with positive reinforcers, learn to respond to electric shock as a cue for impending reinforcement, and endure intense electric shock to escape a lesser intensity shock. In addition, under certain circumstances, animals do not learn that exposing themselves to electric shock is no longer necessary to obtain reinforcers or to avoid other aversive stimuli (Walters & Grusec, 1977). That pain per se is not reinforcing should be evident from the extent to which certain SIBers attempt to enstate conditions associated with no SIB; i.e., restraints, remote control ES equipment, etc. (Weinhouse & Hayes, Note 9).

Related to the onset of SIB, the fourth assumption is that the "initial occurrence may be as an unconditional respondent which may be subsequently shaped by operant reinforcement" (p. 513). Frankel and Simmons hypothesize that, following initial onset and reinforcement, children's tolerance to pain increases and adults begin to respond only when SIB intensity increases, thus shaping more severe SIB. Difficulties in anticipating the onset of SIB and following its early course have precluded any firm proof or disproof of this hypothetical sequence of events.

The connecting thread throughout these assumptions is that social attention is the prime reinforcer of SIB. The possibility that other events within the natural environment may reinforce SIB has rarely been considered. Among the exceptions are demonstrations that application of material restraints (Favell, McGimsey, & Jones, 1978) as well as release from a work room (Carr, Newsom, & Binkhoff, 1976) can serve as reinforcing consequents of SIB. Although adults apply restraints or release individuals from disliked situations, the concommitant presentation or cessation of adult attention is not necessarily the critical variable.

Investigations with pigeons have also shown that superstitious behaviors are strengthened by the accidental occurrence of reinforcers immediately following the behaviors. A similar process may be occurring for SIBers, where events or behaviors not directed to the child accidentally occur or cease immediately following SIB. In addition, the child may engage in additional behaviors following SIB which serve to reinforce the SIB. The identification and analysis of actual consequences which serve to reinforce SIB within the natural environment would broaden our understanding of the sources of variability of SIB within and across individuals.

Status of interventions. Although intervention studies of SIB have utilized primarily single subject designs, several reviews are now available which summarize aspects of these studies. Tabulating the characteristics of 140 SIBers treated in 70 intervention studies, Schroeder et al. (1981) found that individuals' average age was 15 years, length of institutionalization was 12 years, and chronicity of SIB was almost 7 years. In addition, half were male, nine-tenths were severely or profoundly retarded, three-fourths exhibited SIB (as opposed to self-directed behaviors of rumination, self-induced seizures, etc.), and almost four-fifths had "severe organic syndromes."

Punishment has been the most frequently reported intervention (in about half the studies reviewed by Frankel & Simmons, 1976), with electric shock (ES) being the most frequently used punisher. However, differential reinforcement of other behavior (DRO) is most often found in combination with other procedures or alone (Johnson & Baumeister, 1978). Of 49 intervention studies reviewed by Frankel and Simmons (1976), 55% reported complete suppression of SIB, 35% reported partial suppression, and 2% were unsuccessful in reducing SIB. Although punishment resulted in the most rapid decrease in SIB, time out and DRO were most durable (based on the few studies reporting follow-up data). In addition, punishment has been reported to increase and time out to decrease self-biting in Lesch-Nyhan patients. However, effectiveness and type of intervention are unrelated to SIB topography in other SIBers (Schroeder et al., 1981).

In general, follow-up data of response suppression are limited. Only half of the 60 studies reviewed by Johnson and Baumeister (1978) reported follow-up information, and half of these reported anecdotal information only. In addition, generalization to other settings or adults was discussed in only half the articles. Based on those studies employing nonanecdotal data, Schroeder et al. (1981) concluded that punishment generalized least well to other situations.

Published intervention studies for SIB have also been criticized for use of multiple treatments with inadequate design, failure to replicate the same (identical) intervention with multiple individuals, insufficient and unclear description of SIB parameters, absence of systematic information concerning changes in nonself-injurious behaviors, observations limited to brief time periods, consequation of SIB in the absence of any on-going treatment program, and lack of detailed description of the interventions employed (Johnson & Baumeister, 1978). Despite these drawbacks, information regarding characteristics and effects of interventions can be gleaned from the research literature.

Specific interventions for SIB. Interventions designed to reduce SIB have been grouped according to the general type of intervention (differential reinforcement of other behaviors, reinforcement withdrawal, and punishment; Baumeister & Rollings, 1976), the SIB function they purportedly target (positive or negative reinforcement; Carr, 1977), their aversiveness (from least to most aversive; Harris & Ersner-Hershfield, 1978), or the extent to which they are intended to decelerate SIB or accelerate other behaviors (Schroeder et al., 1981). Nevertheless, interventions seldom fall neatly into any one category, instead possessing attributes common to other categories within the given classification scheme.

The most thoroughly researched of the interventions employed with SIB is punishment, which has been defined in terms of process (application of an aversive stimulus) as well as outcome (results in decrease in future occurrence of the behavior). According to Johnston (1972), characteristics of optimal punishment include: initial and continued high intensity stimuli, presentation immediately following each response, no opportunity for escaping punisher, presence of alternative response which can result in the same reinforcer as the punished response, prevention of association of punisher with presentation of reinforcer, and avoidance of long periods of punishment when mild intensity stimuli are used. These guidelines have emerged primarily from studies of electric shock with animals.

Studies with animals (Walters & Grusec, 1977) have shown systematically decreasing response suppression with successively lower intensity shock (110 to zero volts, milliamps not reported), with decreased duration of punisher (3 minutes to 15 seconds), and with increased fixed ratio schedules (fixed ratio 1 to 1,000). Further, gradual increases in ES intensity result in increased tolerance of the stimulus. Response suppression is maintained at near zero during extinction (cessation of punishment) when high intensity shock is used (220 volts, milliamps not reported). However, progressively higher frequency recovery occurs following lower intensity shock (75 to 50 volts) and reaches untreated levels with lowest intensity shock (50 to 35 volts). Similar results have been obtained with avoidance conditioning; i.e., dogs trained to jump a hurdle to avoid intense shock continued to do so long after the ES contingency was terminated.

Differing ES intensities have similar effects on SIB suppression as those obtained with animals. By using high levels of ES (high voltage and milliamps), Lovaas et al. (1969) were able to suppress SIB with very few trials. Other investigators have obtained slower response suppression with lower levels of ES (e.g., Prochaska, Smith, Marzelli, Colby, & Donovan, 1974; 2 milliamps, voltage not reported). The actual intensity of ES is determined less by the voltage than milliamp level. In fact, a reduction in ES intensity midway through Romanczyk and Goren's (1975) study may have contributed to difficulties in SIB suppression.

The change in ES intensity utilized by investigators has been influenced by Butterworth's (1975) identification of hazards of commercial cattleprods and delineation of safety characteristics for ES equipment. Among the safety guidelines recommended are maximum of 5-7 milliamps, upper limit of 1200 volts (to prevent skin puncture), application of ES for one second only, attachment of electrodes within one inch of each other and to an extremity (to prevent current from going through the heart rather than passing between electrodes), and placement of electrodes securely against skin (to prevent electrolytic burns resulting from too loose or tight placement). ES treatment is also contraindicated for individuals with seizure histories.

If improperly presented, punishers actually can become positive reinforcers. Struggles (i.e., escape responses) which ensue during attempted application of punishers may reinforce the behavior and override the aversiveness of the stimulus. Punishing stimuli may also become cues for subsequent reinforcement; e.g., as a cue for impending food (Walters & Grusec, 1977), for subsequent self-restraint, or for differential reinforcement from the caregiver. Delays in consequation also result in reversals of the contingency (SIB appears to terminate the punisher and, therefore, increases in frequency).

Among the major drawbacks of punishment is its high degree of person and setting specificity. Generalization across persons can be obtained following its use by multiple individuals (generalized to a fourth person following administration by three experimenters; Corte, Wolfe, & Locke, 1974). Although generalization across settings may initially occur, it gradually decreases until suppression becomes restricted to the punishment situation (Walters & Grusec, 1977). Generalization gradients are a function of the similarity of a situation to the punishment situation and are the same as those obtained for reinforcement. However, generalization to other settings has been accomplished through use of hidden observers (observers emerged only to consequate SIB; Hall, Thorne, Shinedling, & Sagers, 1973) and a mother therapist (Merbaum, 1973).

Remote control ES equipment was developed to eliminate the need for staff proximity, potential struggles, and inconsistent and unsafe application. However, careful programming for person and setting generalization are required. Weinhouse and Hayes (Note 9) found that by having all classroom staff, houseparents, and parents use remote control ES in all settings, response suppression generalized to new staff, persons unrelated to the consequation program, and all settings (i.e., supermarket, doctor's office, etc.).

Presence/absence or functioning/malfunctioning of the equipment may serve as discriminative cues for the continuation or cessation of the contingency. Romanczyk and Goren (1975) report that SIB occurred whenever electrodes were removed and escalated when equipment failed to function. However, Weinhouse and Hayes (Note 9) were able to demonstrate that increased SIB following equipment removal and during malfunctions is a result of change in staff behavior. When SIB is not reinforced, response suppression can be maintained under these conditions.

Considerable controversy has surrounded the use of ES treatment. Wallace, Burger, Neal, Brero, and Davis (1976) reported that half of the institutions they surveyed did not permit ES treatment and 88% saw ES as the treatment of last resort. Ethical concerns raised have focused primarily on undesirable side effects, such as emotional and aggressive behaviors. However, emotional behavior has not been observed during ES treatment of animals, although aggressive behavior has (Walters & Grusec, 1977). Neither appear to be a necessary outcome of ES treatment with SIBers. In fact, Weinhouse and Hayes (Note 9) observed aggressive behavior in their subject only when equipment could not be activated due to malfunction. This is consistent with Bandura and Walters' view (cited in Walters & Grusec, 1977) that frustration produces an increase in motivation which in turn produces more vigorous responding which is interpreted as aggressive behavior. This effect is obtained following termination of reinforcement as well. In general, positive effects such as increased eye contact, vocalization, and compliance have been reported anecdotally following suppression of SIB with ES (Lichstein & Schreibman, 1976).

A final concern has been the appearance of additional SIB and self-stimulatory behavior following suppression of target SIBs. As will be discussed under ecological findings, this phenomena is not restricted to ES treatment and occurs with all interventions.

Overcorrection has become a preferred intervention in place of ES. Although two types of overcorrection have been developed (restitutive - repeatedly or overly restoring the environment to its original condition, and positive practice - repeatedly engaging in alternative movements), positive practice overcorrection most often is used with SIB. Neither procedure is purely punishment, involving additional components summarized by Schroeder et al. (1981) as:

> (a) negative feedback; (b) time-out from positive reinforcement; (c) verbal reeducative instructions; (d) compliance training like gradual guidance or shadowing; and (e) negative reinforcement. Characteristics related to the success of acts are that they should: (a) be directly related to the misbehaviors; (b) require effort; (c) be applied immediately following the misbehavior; (d) have a lengthy duration; and (e) be performed in a rapid continued manner so as to be inhibiting" (p. 82).

Although overcorrection has been used successfully to suppress SIB, certain negative effects have been reported. First, collateral behaviors have occurred during overcorrection (SIB during positive practice for self-stimulatory behavior, Rollings, Baumeister, & Baumeister, 1977). Second, a negative reinforcement effect has been noted with some individuals (increased SIB which resulted in more or longer periods of overcorrection and, therefore, further avoidance of adult demands, Measel & Alfieri, 1976). And, third, struggles have ensued in some instances leading to the recommendation that overcorrection not be used when more than one person is required to implement the procedure (Schroeder et al., 1981).

Differential effects among subjects have also been reported with restitutive overcorrection (successful suppression with two and increased SIB with one preschooler(s); Barnard, Christophersen, & Wolf, 1976). Novel aspects of this study included excessive medical treatment applied to body parts by children's mothers as well as having children perform the overcorrection on dolls before initiating treatment.

In attempts to find alternatives to ES, a number of relatively new procedures have been explored, including aromatic ammonia, citric acid, and facial screening. Aromatic ammonia, although more easily applied than ES, creates its own set of problems. For example, the capsule cannot come in contact with skin, prolonged use is contraindicated, and the smell lingers, making the contingency more difficult to control (Tanner & Zeiler, 1975). Medical concerns with citric acid include irritation from insufficiently diluted solutions and excessive use as well as risk of aspiration, and a practical concern is inability to insert the solution while an individual's mouth is closed (Mayhew & Harris, 1979). Immediate and durable suppression has been reported with aromatic ammonia (Baumeister & Baumeister, 1978) and near zero suppression with citric acid. Comparison of the two procedures has confirmed the more suppressive effect of aromatic ammonia (Rapoff, Altman, & Christophersen, 1980).

Facial screening is usually classified as a reinforcement withdrawal procedure because covering the face eliminates visual stimuli. However, this certainly fits the definition of an aversive stimulus. Successful suppression of SIB has been reported with an 11-month-old, severely retarded infant (SIB=biting thumb to bone; Singh, 1980) and partial suppression in a 20-year-old male retardate (SIB=face hitting; Lutzker, 1978). Problems encountered are similar to those of all punishment procedures requiring adult contact for administration; e.g., it was difficult to move to the individual in time to consequate each SIB.

Time out, another procedure which involves removal of reinforcement, may comprise various levels of punishment. The term "time out" actually refers to a number of different techniques including brief attention withdrawal; leaving the vicinity of the child for a period of time;

removing the child to another part of the room, to the hallway, to another room, or to an isolation room; restraint in a chair; contingent restraint; response cost; withholding of reinforcers (such as food); and variations of these. Time out also may be used contingently or noncontingently. To further confound matters, release from time out may be contingent on a set time interval, cessation of maladaptive behaviors, or emission of particular appropriate behaviors.

The effects of time out appear to be related to the function of SIB, reinforcing nature of time in, parameters of time out, and certain previously discussed properties of punishment. In the first instance, extended time out may negatively reinforce SIB when adult attention withdrawal or removal of child terminate aversive situations or allow the child to engage in more preferred activity (Gaylord-Ross, Note 1). This same result may obtain in an impoverished or nonpreferred setting, but not with time out from a preferred or enriched setting (Solnick, Rincover, & Peterson, 1977). Effective durations of time out have been reported for 90 seconds up to 30 minutes (Schroeder et al., 1981), although periods of 15 and 30 minutes have been equally effective (Baumeister & Rollings, 1976). Finally, in animal studies time out produced the same effects as ES with fixed ratio schedules (best suppression with FR 1 schedules) and in the absence of alternative behaviors for reinforcement (poor suppression, Azrin & Holz, 1966).

The last of the attention withdrawal interventions, extinction, has also been used to describe a variety of procedures from leaving a child alone for up to an hour and a half (Lovaas et al., 1969) to simply continuing ongoing behavior regardless of occurrences of SIB. Noting that the latter is ineffective due to uncontrolled and accidental reinforcement, Schroeder, Mulick, & Schroeder (1978a) prefer EXT ALT R (non-response to SIB plus reinforcement of alternative behaviors) for group settings. Since one of the characteristics of extinction is increased responding at the outset, its use has been contraindicated for severe SIBers (Smolev, 1971).

As with simple ignoring procedures, differential reinforcement of other behaviors (DRO) has not proven effective when used alone. However, when used in conjunction with other procedures, it has enhanced the effectiveness of these procedures. One problem with DRO is that no particular alternative behaviors are reinforced, resulting in what Schroeder et al. (1978a) call reinforcement for zero responding. Reinforcement of alternative behaviors (DRA), used alone and in combination with other procedures, has proven more effective. Differing opinions exist on the need for reinforcement of incompatible behaviors versus alternative behaviors. Tarpley and Schroeder (1979) obtained superior results with DRI, whereas Young and Winczel (1974) reported suppression of the targeted SIB only. In addition, some studies reporting use of DRI may in fact be requiring actions that are aversive to the individual, thus employing punishment.

Within the SIB literature little attention has been paid to the effectiveness of differing reinforcers. Anecdotal reports mention edibles, verbal praise, physical contact, and sensory input (e.g., vibrator). Food as a reinforcer has generally been most effective during mealtimes (Myers & Diebert, 1971; Ragain & Anson, 1976). Hand holding, utilized in past studies of SIB (e.g., Tate & Baroff, 1966) may actually have served the same function as material restraints. That material restraints can be used as a reinforcer to reduce SIB as well as to increase correct responding has been demonstrated by Favell and her colleagues (Favell et al., 1978; Favell, McGimsey, Jones, & Cannon, 1981).

Material restraint as a means of controlling SIB antedates all interventions discussed in this section; in fact, earliest interventions were investigated in order to free subjects from restraint. Prolonged, noncontingent restraint results in the individual engaging in SIB both following release from and prior to application of restraint. The relationship between SIB and restraint may be learned in the same way that increasingly frequent and severe SIB is shaped; i.e., an individual can learn to obtain material restraints through appropriate behavior (signing), by a specific number of SIBs (e.g., two SIBs), or by escalating SIB (Weinhouse & Hayes, Note 9). It can be seen that use of restraints, when not carefully programmed, can cause SIB to worsen in the long run. An additional negative side effect, just beginning to receive attention, is the development of self-restraint behaviors. When engaged in by the individual, these behaviors can interfere with the emission of adaptive behavior in the same way that adult-applied restraint did in the past. A more judicious use of restraint, *contingent restraint* (brief and faded physical restraint) has proven successful in conjunction with EMG feedback by Schroeder, Peterson, Solomon, and Artley (1977).

Ecological Formulations

Ecobehavioral analysis constitutes an extension of the learning theory or S-R approach to SIB. Schroeder at al. (1981) have identified two major dimensions of study:

> The first refers to the system of *intrapersonal behavior* where the person is viewed as demonstrating a complex of

> interdependent behaviors. In this context, it is assumed that by changing one behavior, other behaviors of the same person will be affected. The second refers to a person within his/her physical and social context. Here, the arrangement of settings is seen as influencing a person's behavior and this person in return is seen as affecting his/her environment. (p. 69)

Systematic investigation of these dimensions was applied initially to aggressive and disruptive behavior in children. Patterson (1979) has developed a comprehensive model of family interaction patterns with socially aggressive children. Within this model, a negative reinforcement paradigm is utilized in which stimulus cues are viewed as controlling the onset and escalation of socially aggressive behavior. Treatment involves the manipulation of both stimulus cues and consequences. Observational procedures employ multiple behavior codes which allow for sequential recording of interaction patterns. With this methodology, it is possible to identify antecedents to aggressive behavior, the organization of aggressive behaviors, changes in collateral behaviors, and effects of consequents. On a smaller scale, researchers have documented sets of covarying behaviors that are stable across settings (Wahler, 1975), the effects of suppression of target behaviors on response classes defined through factor analysis (Kara & Wahler, 1977), and the relationship of behaviors to settings (Strain & Ezzell, 1978).

The application of ecobehavioral analysis to SIB is a recent phenomenon. As a result, no model of explanatory power equivalent to Patterson's social interaction theory has been developed. However, single subject studies have been undertaken to investigate the effects of antecedent conditions and stimulus cues on SIB, the interactional effects of antecedent conditions and interventions, and the determinants of response covariation.

Antecedent conditions. Antecedents to SIB can be conceptualized as conditions antecedent to or concurrent with SIB or as behaviors or events immediately preceding SIB. Antecedent conditions studied to date include environmental enrichment, activity routine, task preference, and task difficulty.

To further elucidate the relationship between the reinforcing value of time in and the effectiveness of time out, Williams, Rojahn, Eckerman, and Schroeder (Note 10) compared four conditions: custodial care with no toys and minimal adult interaction, presence of toys with minimal adult interaction, supervised play with toys, and adult interaction in the absence of toys. Findings indicate that conditions have differential effects within and between individuals. During baseline, stereotypy increased during the most impoverished condition for one individual, play increased for two individuals during the two adult interaction conditions, and SIB was unaffected by changes in conditions. When contingent restraint time out (material restraint for 90 seconds in a chair with release contingent on 15 seconds "good behavior") was introduced, SIB by two children decreased most in the enriched conditions but was unrelated to condition for the remaining two children.

The ordering of tasks within daily routines has also been observed to affect SIB frequency. In their study of a 25 year old deaf/blind woman, Schroeder and Humphrey (Note 2) report increased SIB following disliked activities, decreased SIB following preferred activity, and higher SIB when a given task was implemented in the morning as compared to the evening.

In the first study of the effects of task preference on SIB, Carr et al. (1976) demonstrated near zero SIB by an 8 year old schizophrenic boy during preferred activities (free play and tacts) and high rate, escalating SIB during a nonpreferred activity (mands). The escalation pattern was controlled by the verbal cue "Let's go," which signalled termination of the activity. SIB was controlled similarly by the stimulus paired with each condition (color of room) and could be reduced by embedding mands in a more preferred story telling activity. Gaylord-Ross et al. (1980) obtained similar results with preferred and nonpreferred classroom tasks (puzzle and sorting by color). In addition, SIB (self-biting) increased concommitant with increased mands.

The relationship between task difficulty and SIB is evident most clearly in Weeks' (198) comparisons of an easy task, trial and error difficult task, and errorless learning difficult task. Frequency of SIB (self-biting) was zero or near zero during baseline, the easy task, and the errorless learning task. In contrast, SIB occurred on 48% of trials and following 50% of errors (being told she had made an error) on the trial and error task.

Antecedent stimuli and SIB. The role of immediate antecedents to SIB has received less attention than that of antecedent conditions. With the exception of Carr et al.'s (1976) findings discussed earlier, most investigations have focused on the effects of punishment stimuli. When overcorrection or other negative consequences previously have been employed, cessation of the target behavior has been directly related to adult proximity. As the adult moves closer, target behaviors cease; and when the adult is farther away, the target behaviors increase (Rollings, Baumeister, & Baumeister, 1977). Individuals also are able to discriminate visual cues (position of lights on a linear panel) signalling overcorrection versus safe conditions (Baumeister & Rollings, 1976).

Levison's (1970) more naturalistic description of stimulus control of headbanging by a rhesus monkey is surprisingly similar to antecedents to SIB encountered with the severely and profoundly retarded. Antecedents included delay in being fed, loud noises, removal of desired objects, and adult approach and leave behaviors associated with these events.

Response covariation. Increases in nontargeted SIB and other maladaptive behaviors were reported in anecdotal form in the intervention literature. These effects, termed symptom substitution, were thought to reflect the hierarchical organization of behaviors within the SIBer's repertoire. As given behaviors were suppressed, the next highest probability behavior would emerge, and so forth until all behaviors in the hierarchy were exhausted.

Investigations of treatment effects have shown both positive and negative covariation of behaviors. During DRI, Tarpley and Schroeder (1979) report positive covariation of SIB and negative vocalization for all three of their subjects, increased aggressive behavior concommitant with increased SIB in one subject, and negative covariation of self-stimulatory behavior with SIB in one subject (increase in one behavior accompanied by decrease in other behavior). A similar inverse relationship was obtained for targeted versus nontargeted behavior during overcorrection by Rollings, Baumeister, and Baumeister (1977).

In a more comprehensive study of the effects of overcorrection, Johnson, Baumeister, Penland, and Ewald (1982) found that behaviors which covaried negatively with the target behavior increased during overcorrection, while behaviors which covaried positively during baseline were suppressed along with the target behavior. These corollary behaviors increased in frequency as the subject began to descriminate punished from unpunished behaviors.

Shifts in SIB topography have also been documented for different types of adaptive clothing (e.g., increased face hitting with a neck-brace and increased head to shoulder hitting with hands in jacket pockets; Rojahn, Mulick, McCoy, & Schroeder, 1978). Similar effects have been observed with more traditional restraints (decreased head hitting and biting, increased knuckle digging, and emergence of knee to head hitting with arm splints, Weinhouse & Hayes, Note 9; decreased face hitting and increased foot pounding with mittens, Schroeder & Humphrey, Note 10). Schroeder and Humphrey (Note 10) also report changes in SIB topography depending on the body parts employed in educational activities (head-banging during mand training, face and head to shoulder hitting during instruction following, head to shoulder hitting during self-feeding, etc.).

The effects of diverse interventions on SIB "run" duration have received little attention. Interestingly, Tarpley and Schroeder (reported in Schroeder et al., 1980) found inter-individual differences in the effects of baseline, DRO, and DRI on mean duration of SIB. Although DRI generally resulted in lowest SIB duration, additional patterns were obtained; e.g., DRO greater or equal to baseline for two subjects and DRI greater than DRO during only a physically guided phase of DRI. In addition, relationships among interventions for frequency of SIB were not necessarily those obtained for SIB duration.

A final area of study has been cyclic patterns of stereotypy and SIB. Lewis, MacLean, Johnson, and Baumeister (1981) identified 4 hour cycles, corresponding to institutional routines, and 1½-hour to 2-hour subpatterns, possibly reflecting endogeneous rest-activity patterns. Patterns also changed when routines were altered. In one subject self-hitting and self-stimulatory behavior co-occurred, although no lead-lag relationship was discernable.

Response-response relationships that have not been investigated yet with SIBers are response classes across the child's repertoire, sequential patterns of response, and differential stimulus control of SIB and nonself-injurious behaviors. Understanding of such relationships can only improve our interpretation of present variability as well as our prediction of future effects of antecedent and consequent manipulations.

METHOD

Definition of SIB

For purposes of this study, SIB is defined as repeated contact of one body part with another (e.g., self-biting, face slapping, hair pulling, digging with fingernails) or contact of body with an object (e.g., banging head against floor, wall, or furniture) which has caused tissue damage in the past (e.g., reddening, bruising, callousing, infection, or destruction of tissue). SIB is distinguished from other repetitious or potentially harmful behaviors, including self directed SIB, self-stimulatory behavior, suicidal gestures, accidental injuries, and habit behaviors.

Part I: Survey

Subjects

Subjects for survey measures were 82 children for whom permission and information were obtainable out of a total of 100 SIBers referred to the study. Of these, 27 were 2-6 years old (mean age=52.6 months, S.D.=18.1, range=23-83), 14 were 7-11 years old (mean age=113.1 months, S.D.=18.9. range=87-141), and 41 were 12-22 years old (mean age=207.0 months, S.D.= 36.3, range 150-278). Table 1 shows the breakdown of children by age group and county.

Table 1

Mean Age of SIBers Included in Survey by County and Age Group

	Franklin			Delaware			Marion		
Age Group	(N)	Mean	S.D.	(N)	Mean	S.D.	(N)	Mean	S.D.
2-6 years	(26)	53.1	(18.3)	(1)	40.0	(0.0)	(0)	-	-
7-11 years	(12)	114.6	(19.6)	(1)	115.0	(0.0)	(1)	93.0	(0.0)
12-22 years	(35)	198.7	(32.3)	(1)	211.0	(0.0)	(5)	256.0	(20.7)

The SIB group comprises all identifiable children, ages 2-22 years and engaging in SIB, who reside in the community and/or are served by community programs in Franklin, Delaware, and Marion Counties; i.e., children who live with their parents, with foster parents, or in group homes; and/or who attend community classes; and/or who reside in residential educational facilities during the school year.

The three central Ohio counties targeted by the study were selected based on proximity to Columbus, population density, number of children served by the local 169 program (derived from Ohio Annual Financial and Statistical Report for Fiscal Year 1979), and quality of services. Franklin is an urban county, contains the largest population and the state's capitol, and served the greatest number of children in fiscal year 1979 (303 homebased, 169 preschool, and 603 school age). Delaware and Marion are essentially rural counties, provide quality programs, but served fewer children (Delaware - 20 homebased, 16 preschool, 37 school age; Marion - 29 homebased, 17 preschool, 61 school age). Initial attempts to include Licking County, a rural county with a large 169 program, were discontinued due to slow response of county programs and greater than anticipated referrals from the first three counties.

Programs that potentially serve children meeting the aforementioned criteria were identified through various service delivery directories and include county 169 programs; county welfare departments; city and county school systems; community mental health centers; advocacy networks; regional service delivery systems; diagnostic centers; day care centers; and public and private residential and day programs for the visually, hearing, physically, learning, and emotionally handicapped. Programs received an initial form letter requesting assistance in identification of children and/or participation in the study (see Appendix A Program Contact Letters). Most programs serving SIBers granted inclusion in survey and observational components, but required parental permission for child assessment and review of records, whereas some programs required parent permission for all components of the study. Parent permission was secured by program directors for those programs serving few SIBers and by the investigator for those programs with numerous SIBers (see Appendix B Parent Permission Letters).

Procedure

The survey comprised:

1. completion of screening form by program supervisor;
2. administration of the SIB Perception Questionnaire to present teachers, past teachers, and parents;
3. administration of the Antecedent/Consequent Card Sort to present teachers, past teachers, and parents;

4. interview with teachers;
5. completion of the A.A.M.D. Adaptive Behavior Scale by teachers and parents; and
6. review of records.

The initial screening form (Appendix C) was completed by supervisors before parent permission was solicited. The screening form provided initial information on children's ages as well as SIB topographies and frequencies and was utilized to determine suitability for inclusion in the study. The SIB Perception Questionnaire and Antecedent/Consequent Card Sort were completed by teachers in the presence of the investigator immediately prior to implementation of Parts II through IV of the study. SIB frequency ranges reported on the questionnaire, in conjunction with discussion with teacher, were utilized to determine extent of inclusion in subsequent components of the study. The ABS was scored by the teacher within one month of the questionnaire. Questionnaires were administered to parents and educational records were reviewed following completion of data collection in school programs.

Data collection for survey and other components of the study was carried out in the order in which program and parent permission were received. Appendix D includes the schedule of observations for school programs, beginning May 1981 and terminating February 1982.

Instrumentation

SIB Perception Questionnaire. The SIB Perception Questionnaire (Appendix E) was developed specifically for use in this study. Content areas were formulated and items chosen for the questionnaire according to guidelines for questionnaire construction outlined by Sellitz, Jahoda, Deutsch, and Cook (1959) and for construct development by Fiske (1971). Content areas were ordered to facilitate recall by beginning with past general behavior and then systematically introducing more recent and specific behavior. The questionnaire was initially piloted with a project staff member who had served as a foster parent and teacher for select children. Wording and format were revised based on the staff member's feedback.

Information derived from the questionnaire is as follows:

Onset of SIB - Retrospective information concerning age of onset of SIB, first behavior noticed, and conditions surrounding the first occurrence.

SIB topographies - Comprehensive listing of topographies observed, age of onset, age stopped, conditions resulting in onset of new topographies, and ranking of topographies from most to least frequent.

Frequency of SIB - Estimates of the lowest frequency and the highest frequency of SIB, utilizing a 15-point scale ranging from less than once a week to 1,000 or more times per hour.

Self-restraint behaviors - Indication of the presence or absence of self-restraint behaviors, the types of self-restraint behaviors observed, their age of onset or cessation, and the extent to which they interfere with other appropriate behaviors. Self-restraint behaviors include trying to get others to hold child's hands, holding own hands, pulling sleeve over hand, putting hands inside shirt, wrapping hands in material, winding string-like objects around hands or fingers, hooking hands or fingers around furniture, holding objects, placing small objects or fuzz between fingers, and other self-restraint behaviors.

General antecedents to SIB - Indication of the absence or presence of commonly reported antecedents to SIB, including unexpected sounds or movements, specific behavior requests by adults, any adult speech, adult approach to child, child left alone, child touched by adult, approach to certain areas or places, discrete actions by child, unsuccessful task performance, attempts by adult to stop self-stimulatory or other inappropriate behavior, no apparent antecedent, and other; selection of the most frequently occurring antecedents.

Interventions used in treatment of SIB - Description of past and present interventions, person or setting implementing the intervention, and effects of interventions.

Cause and function of SIB - Description of the perceived cause of onset of and conditions currently maintaining SIB; perception of the degree to which child can control the SIB.

Age related changes - Recording of information for the present (since September) as well as for the past time period (prior to September) during which the informant worked with or cared for the child. Past information is divided into three age groups being investigated; i.e., 2-6 years, 7-11 years, and 12-22 years.

Whereas information for onset of SIB, SIB frequency, self-restraint, and antecedents was useable in the form recorded, remaining areas required content analysis. In accordance with definitions specified in the observational coding system (see Part III, Standard Activities), topographies were assigned to one of ten categories, including head banging, hand biting, face hitting, hair pulling, digging/scratching, knee to head hitting, object to face hitting, kicking self, eye poking, and other SIB. These general categories were in turn subdivided into 32 topography subtypes (see Table 2) and 94 specific variations (see Appendix F for listing of topography variations).

Interventions for self-injurious behavior were analyzed by content into seven major categories of aversive consequence, restraint, alternative behavior, positive consequence, ignore, counseling, and restructuring environment. Table 3 lists the 16 intervention subcategories comprising the major categories, and Appendix G includes the 43 specific intervention groupings. Where interventions comprised more than one component or multiple interventions were in use, the primary component or most frequently used intervention was termed the major component and the accompanying component or less frequently used intervention was termed the second component. Effects of interventions were scored on a scale from 1 to 3, with 1=decrease in frequency; 2=maintain, variable, or no effect; and 3=increase in frequency or behavior worsened.

And finally, the perceived etiology of and conditions maintaining the SIB were also content analysed. Derived categories are reported in the Results section.

Content analysis of above areas and findings from the questionnaire constituted the basis for revision of the questionnaire. The revised form, available for professional use, is contained in Appendix H.

Table 2

SIB Topography Subtypes

General Topography	Topography Subtype
Head banging	Head bang to objects Teeth bang to objects Head bang to persons
Biting self	Bite hand Bite fingers Bite arm Bite foot Bite clothing
Face hitting	Face hit with open palm Skull/ear hit with open palm Face hit with fist Skull/ear hit with fist Face hit with upper arm
Hair pulling	Hair pull
Digging/scratching self	Pinch self Dig nails in body part Scratch self
Knee to head hitting	Bang knee to head Bite knee
Object to face hitting	Object to face hit
Kicking self	Kick shin Foot to foot press Knee/leg to object
Eye poking	Poke eye
Other SIB	Knuckle to face Hand press to face Object to head Bite object Ear pull/poke Hit other body part Hit objects with hand Other

Table 3

Interventions in Use for Self-Injurious Behavior

Major Category	Subcategory
Aversive consequence	Negative physical consequence Negative speech consequence Time out Attention withdrawal
Restraint	Material restraint Physical restraint
Alternative behavior	Differential reinforcement Functional alternative Verbal request
Positive consequence	Positive physical Positive speech Change activity Vestibular/tactile
Ignore	Ignore
Counseling	Counseling
Restructure environment	Restructure environment

Antecedent/Consequent Card Sort. The Antecedent/Consequent Card Sort (Appendix I), also developed for use in this study, comprises 330 items, each describing a discrete behavior or event which may immediately precede or follow SIB. The items were chosen as representative of behaviors subsumed under each of 56 categories in the observational coding system (see Part III: Standard Activities). The general categories utilized are contained in Table 4.

The card sort was piloted with teachers for four SIBers varying in age (6, 16, 16, and 17 years old), severity of SIB (20 to over 1,000 times per hour), number of topographies (1-6 different topographies), and presence or absence of self-restraint behaviors (two children with and two children without self-restraint behaviors). Teachers were also asked to indicate whether any antecedent events or behaviors were missing from the card sort. Since items on the card sort were not similarly grouped for the pilot subjects, initial collapsing of items to form a smaller card sort deck was contraindicated. Utilizing scores obtained from data collection, the card sort items have been reduced in number and regrouped empirically. The revised form (see Appendix J) is now available for professional use.

The final form of the card sort for study use included a set of cards, each containing a separate item. Cards were then sorted by informants into one of five piles, and results were transferred to a typed protocol. Criteria for assignment to each of the five card piles was as follows:

Table 4

Antecedent/Consequent Card Sort Categories

General Category	Subcategory
1. Environmental stimuli (not directed to child)	Auditory environmental stimuli Visual environmental stimuli Tactile/kinesthetic environmental stimuli
2. Adult-peer interaction	Adult-peer interaction
3. Social attention	No interaction Interaction
4. Adult proximity	Adult approach Adult leave
5. Adult physical contact	Adult physical contact
6. Task presentation variables	Visual task presentation Auditory task presentation Tactile/kinesthetic task presentation Administer Terminate
7. Task performance	Task performance, correct Task performance, approximation Task performance, error
8. Discrete child behavior	Discrete child behavior
9. Positive reinforcement	Administer positive reinforcement Terminate positive reinforcement
10. Ignore	Ignore Adult ignore child Child ignore adult
11. Restraint	Adult initiated restraint Child initiated restraint (self-restraint) Adult terminated restraint Child terminated restraint
12. Watch	Watch Adult watch child Child watch persons, activities, or objects
13. Work	Work (independent work)

Table 4 (continued)

General category	Subcategory
14. Independent or play activity	Independent or play activity (self-initiated)
15. Unoccupied	Unoccupied
16. No response	No response Adult no response Child no response
17. Self-stimulatory behavior	Self-stimulatory behavior
18. Adult stop self-stimulatory behavior	Adult stop self-stimulatory behavior
19. Transitional behavior	Transitional behavior
20. Nonverbal Social Communication	Child, simple object directed Child, simple person directed Child, complex object directed Child, complex person directed Child, transitional Child, coordinate person and object Adult, coordinate person and object Child, referential Adult, referential Child, coordinated
21. Nonverbal negative/manipulative behavior	Child, negative motor-gestural Child, negative actions on objects Adult, negative actions on objects Child, negative physical contact Adult, negative physical contact Child, negative vocalizations
22. Positive symbolic social/communication	Child, positive symbolic Speech (behavior request, information statement, information request) Sign Adult, positive symbolic Speech (behavior request, information statement, information request) Sign
23. Negative symbolic social/communication	Child, negative symbolic Adult, negative symbolic

Prior to the past month

Pile 1: Never happened before or after self-injurious behavior.

Pile 2: Used to happen before or after self-injurious behavior, but hasn't during the past month.

During the past month

Pile 3: Occurred infrequently (less than half the time) immediately before or after self-injurious behavior

Pile 4: Occurred some of the time (about half the time) immediately before or after self-injurious behavior.

Pile 5: Occurred often (more than half the time) immediately before or after self-injurious behavior.

A.A.M.D. Adaptive Behavior Scale (ABS). The ABS comprises 10 adaptive behavior domains and 14 maladaptive domains (see Table 5 for ABS domains). A total score is obtained for each domain by summing item scores. The domain scores are then transformed to deciles, utilizing normative conversion tables for the child's age group. To enable comparison of results with findings from institution-based surveys, institutional norms were employed for scoring the ABS (Fogelman, Madow, Leland, Libby, & Nihira, 1974).

Review of Records. Program supervisors were contacted for information regarding correlated characteristics (diagnosis/etiology, sensory and motor impairments).

Reliability

Due to the large number of children identified and included in the study, it was not possible to administer teacher and parent questionnaires contiguously as a measure of inter-observer agreement. However, a measure of stability of behavior was obtained through comparison of past teacher and present teacher questionnaires for 18 children (see Results). The extent to which the present teacher's perception of SIB frequency, topographies, and antecedents corresponds to actual behavior is obtained through comparison of questionnaire and card sort information with observational findings of Part III Standard Activities and Part IV Naturalistic Observation.

Six months after initial completion by teachers, additional ABSs were obtained for a mixture of nine high and low rate SIBers. Reliability for ABS domains and individual children's protocols was calculated as total score agreement divided by total score agreement and disagreement. As might be expected, scores for Part I Adaptive Behavior domains were more stable than those for Part II Maladaptive Behavior domains. Test-retest agreement averaged 87% (range=69%-99%) for Part I domains and 80% (range=46%-100%) for Part II domains. When individual protocols are considered, average agreement for teachers at time 1 and time 2 was 87% (range=66%-98%) on Part I and 70% (range=43%-100%) on Part II.

Table 5

Test-Retest Agreement for Adaptive Behavior Scale Domains

Domain	Percent Agreement
Part I	
Independent Functioning	99%
Physical Development	93%
Economic Activity	80%
Language Development	90%
Numbers and Time	69%
Domestic Activity	92%
Vocational Activity	77%
Self-Direction	89%
Responsibility	83%
Socialization	94%
Part II	
Violent and Destructive Behavior	76%
Antisocial Behavior	94%
Rebellious Behavior	97%
Untrustworthy Behavior	80%
Withdrawal	79%
Stereotyped Behaviors and Odd Mannerisms	100%
Inappropriate Interpersonal Mannerisms	46%
Unacceptable Vocal Habits	75%
Unacceptable or Eccentric Habits	100%
Self-Abusive Behavior	64%
Hyperactive Tendencies	93%
Sexually Aberrant Behavior	100%
Psychological Disturbances	67%
Use of Medication	82%

Part II: Cognitive Assessment of SIBers

Subjects

For inclusion in the remainder of the study, children were required to exhibit one of the major SIB topographies (head banging, self-biting, face hitting, or hair pulling) and have a recent history of 8-10 incidents of SIB or of at least 50 SIBs on more than one day. For children attending half-day programs, one-half the number of incidents of SIB was required. Exceptions included children who had exhibited high frequency SIB during the past year, the frequency of which had been decreased through planned intervention.

Of 52 children meeting the above criteria, 48 were available for inclusion in Part III Standard Activities, and 43 received the cognitive assessment. Of these, 7 were 2-6 years old (mean age=45.2 months, S.D.=13.1, range=28-64); 9 were 7-11 years old (mean age=108.2 months, S.D.=14.4, range=87-136); and 27 were 12-22 years old (mean age=202.6 months, S.D.=32.7, range=150-268). Table 6 outlines additional characteristics of these children.

Procedure

Within one to two weeks after observation, each subject was assessed with the Sensori-Motor Assessment and/or a preoperational-level standardized intelligence test. Choice of assessment instrument was determined by child's functioning level, i.e., ability to perform test items. The cognitive assessments were carried out with a standard set of materials and procedures; with minor variations for child preferences, functioning

Table 6

Characteristics of Children Receiving Cognitive Assessment and Standard Activities

	Age Group and Condition[a]					
	2-6 year		7-11 year		12-22 year	
Child Characteristics	C	S.A.	C	S.A.	C	S.A.
Sex						
Male	5	(9)	7	(8)	16	(17)
Female	2	(2)	2	(2)	10	(10)
Physical and Sensory Handicaps[b]						
Vision only	1	(1)	0	(0)	1	(1)
Hearing only	0	(0)	0	(0)	0	(0)
Vision and hearing	0	(0)	0	(0)	8	(8)
Physical only	0	(1)	3	(4)	6	(6)
Vision and physical	0	(0)	1	(1)	0	(0)
No handicap	6	(9)	5	(5)	11	(12)
Expressive Language						
Verbal	2	(2)	2	(2)	5	(5)
Nonverbal	5	(9)	7	(8)	21	(22)
Total Number Children	7	(11)	9	(10)	26	(27)

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[a] C=Part II Cognitive Assessment; S.A.=Part III Standard Activities.

[b] Vision handicap=partially sighted to totally blind; hearing handicap=hard of hearing to profoundly deaf, temporary conductive loss excluded; physical handicap=gross motor handicaps due to neuromotor dysfunction or joint dislocation, developmental delay excluded.

level, and sensory or motor handicaps; and in a quiet room within children's school buildings. Testing was continued until the child was cooperative and "a best performance" was obtained.

In most instances a brief attention withdrawal was used contingent on SIB (to avoid fortuitous reinforcement) followed by redirection to task. The school intervention was implemented where use of attention withdrawal would have reduced effectiveness of the school intervention by introducing inconsistent consequation or would have endangered the subject due to high rate, severe SIB. Where school procedures were unsuccessful or precluded testing, an alternative intervention was designed which would control the SIB while enabling testing to continue. An example of the latter situation was a school procedure utilizing arm splint restraints contingent on SIB as a result of which SIB occurred whenever restraints were removed, and thus effectively prevented any task behavior.

Instrumentation

Sensori-Motor Assessment. The Sensori-Motor Assessment was adapted from the Uzgiris and Hunt Scales of Infant Psychological Development (1975) and the Sensorimotor Assessment developed by Cordelia Robinson and revised at the Meyer Children's Rehabilitation Institute (Note 11). The best characteristics of each scale were combined to form the present protocol; e.g., the object permanence subscale and format for recording incidental information from Robinson's instrument, and format for response alternatives for each item from the Uzgiris and Hunt instrument. The complete, revised protocol is contained in Appendix K along with a listing of item sources.

The Sensori-Motor Assessment comprises seven subscales; i.e., object permanence, means-end, causality, spatial relations, object schemes, verbal imitation, and gestural imitation. Object permanence assesses ability to find objects displaced from view and ultimately to mentally reverse sequences. Means-end involves the use of intermediary means as tools and the use of foresight in problem solving. Causality targets the developing ability to infer cause from effect and vice versa. Spatial relations assesses understanding of spatial gradients and the use of objects in relation to each other. Object schemes focuses on interaction with objects, beginning with simple schemes and terminating with pretend behavior. And verbal and gestural imitation reflect ability to imitate visible and invisible models as well as familiar and unfamiliar behavior. Verbal imitation terminates in immediate imitation of new words, and gestural imitation with deferred imitation free of time, place, and person. Table 7 summarizes characteristic behaviors within each subscale.

Each Sensori-Motor Assessment subscale was scored in three ways; i.e., by number of items passed, by mental age equivalents (derived from Uzgiris and Hunt average ages of attainment and from McNally and Robinson, Note 12), and by stage placement (obtained from the McNally and Robinson format). Stage placements were assigned values of .3 for beginning, .6 for middle, and .9 for end stage performance (e.g., beginning Stage V would be assigned a value of 5.3). A summary of the three scoring systems is contained in Table 8.

Standardized Tests. Standardized testing comprised both performance and/or verbal measures appropriate for various sensory handicaps, i.e.; the Arthur Adaptation of the Leiter International Performance Test (1952)

Table 7

Sensori-Motor Behaviors by Stage and Subscale

	Stage II	Stage III	Stage IV	Stage V	Stage VI
Object Permanence	Look at point where object disappeared	Retrieve partially covered object	Find objects visibly hidden under one or more screens	Find objects invisibly hidden under one of multiple screens	Reverse sequence of hiding to find object
Means-End	Repeat accidental movements	Visually directed reach	Move barrier, pull string, crawl to obtain object, pull supports	Accidentally discover use of unattached tools.	Solve problems by foresight (mental reflection)
Causality	Same as means-end	Movements as procedures	Manually activate objects	Give object for assistance, attempt to activate with demonstration	Mechanically activate objects
Spatial Relations	Visually/auditorally localize objects	Look for objects dropped from view	Put objects in and take out of containers	Recognize gravity, detour around barriers	Indicate absence of familiar persons
Object Schemes	Simple schemes (hit, pat)	Examine, beginning differentiation	Complex schemes (push, roll, crumple, swing, etc.) Drop, throw	Functional use singly and in combination by trial and error Point, show, name	Pretend play
Imitation	Movement/sound to familiar schemes	Imitate visible and gradually approximate invisible actions in repertoire	Gradual approximation of similar new movements	Direct imitation of new movements, movement combinations, and words	Deferred imitation - free of object, place, and person

[a] Adapted from Uzgiris-Hunt (1975), McNally and Robinson (undated), and Piaget (1962)

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Table 8

Scoring for Number of Items Passed, Mental Age Equivalent, and Stage Placement on Sensori-Motor Assessment Subscales

Number Items	Sensori-Motor Subscales													
	OP		ME		CAUS		SR		SCH		VI		GI	
	MA	Stage	MA	Stage	MA	Stage	MA	Stage	MA	Stage	MA	Stage	MA	Stage
1	1	1.9	2	2.3	2	2.3	3	2.3	2	1.9	1	1.9	4	2.9
2	2	2.3	3	2.3	3	2.3	5	2.9	3	2.3	1	1.9	5	3.3
3	5	3.3	4	2.9	4	3.3	6	3.3	4	2.9	3	2.3	7	3.9
4	6	3.6	4	3.3	5	3.9	7	3.6	5	3.3	3	2.9	8	3.9
5	7	3.9	9	3.9	11	4.9	9	3.9	6	3.6	4	3.3	9	4.3
6	9	4.3	9	4.3	11	4.9	9	4.3	8	4.3	9	3.9	10	4.6
7	11	4.6	12	4.9	13	5.3	9	4.9	9	4.6	12	4.9	10	4.6
8	12	4.9	13	5.3	18	5.9	13	5.3	11	4.9	13	5.3	11	4.9
9	12	4.9	8	4.6/5.3	21	6.9	15	5.6	13	5.3	14	5.3	11	4.9
10	14	5.3	10	4.9/5.6	-	-	15	5.6	15	5.6	15	5.6	14	5.3
11	16	5.6	16	5.9	-	-	17	5.9	16	5.9	16	5.6	17	5.6
12	17	5.9	20	6.3	-	-	18	6.3	18	5.9	17	5.9	15	5.6
13	22	6.6	22	6.9	-	-	-	-	22	6.9	-	-	20	5.9
14	-	-	-		-	-	-	-	-	-	-	-	20	6.3
15	-	-	-		-	-	-	-	-	-	-	-	22	6.9

for children with hearing or language handicaps and/or mild motor involvement, the Peabody Picture Vocabulary Test (1970) for children with expressive language difficulties and/or motor handicaps, and the Perkins-Binet Intelligence Test for the Blind (1980) for visually handicapped children with usable vision (Form U) and nonusable vision (Form N).

Children whose functioning levels were within the preoperational period often were unable to perform on both verbal receptive and performance measures or exhibited markedly discrepant ability levels between these measures. Therefore, for purposes of data analysis, the highest test performance was utilized.

Reliability

A second observer, trained in scoring the Sensori-Motor Assessment, independently viewed and scored five videotaped assessments of children with behaviors at each of Stages III, IV, V, and VI. Inter-observer agreement was calculated as number of agreements divided by number of agreements and disagreements for subscale stage placement and for scoring of the individual items. Average inter-observer agreements for trained observer with investigator's live scoring, trained observer with investigator's videotape scoring, and investigator's videotape scoring with live scoring were 96%, 94%, and 100% respectively for subscale stage placements, and 97%, 97%, and 97% for test item scoring. Overall range for stage placement agreement was 80-100% and 94-100% for test item agreement. Interobserver agreement for each subscale within each condition is summarized in Table 9. Lowest agreement for stage placement (80% for Causality subscale) was entirely due to disagreement regarding one item on one protocol.

Table 9

Inter-Observer Agreement for

Sensori-Motor Assessment Subscales and Items

Condition	Sensori-Motor Assessment Subscales				
Subscale Agreement	OP	ME	CAUS	SR	SCH
O. Video/E. Live	100%	100%	80%	100%	100%
O. Video/E. Video	100%	100%	80%	100%	100%
E. Video/E. Live	100%	100%	100%	100%	100%
Item Agreement					
O. Video/E. Live	97%	94%	96%	98%	100%
O. Video/E. Video	98%	95%	98%	100%	96%
E. Video/E. Live	97%	95%	98%	100%	100%

Part III: Standard Series of Activities

Subjects

Subjects were 48 children identified as high rate SIBers in Part II and comprised 11 children in the 2-6 year age group (mean age=55.9 months, S.D.=18.2, range=28-83); 10 children in the 7-11 year age group (mean age=111.4 months, S.D.=17.2, range=87-141); and 27 children in the 12-22 year age group (mean age=202.2 months, S.D.=35.1, range=150-268). (See Table 6 in Part II Cognitive Assessment for additional child characteristics.)

Procedure

Administration of the standard series of activities was carried out by the child's teacher in the child's usual work area (or in a semi-isolated area of the room if the work area was adjacent to other children) at a time of day when the child was normally engaged in table tasks. Each teacher was given written instructions approximately one week prior to the session to allow time to resolve any questions which might arise (see Appendix L for standard activities instructions). Standard activities were carried out insofar as possible during the same week that questionnaires were completed. In order to avoid influencing the child's usual behavior or drawing attention to the observer, children qualifying for Part IV Naturalistic Observation received standard activities on the afternoon of or the next day following the last observation.

The time required for the entire series of activities was 30 minutes, with each condition lasting 5 minutes and no breaks between conditions. Order of conditions was alternated, resulting in two possible sequences of activities; i.e., Order 1=Easy, Difficult, Easy, Nonpreferred, Preferred, Nonpreferred; Order 2=Difficult, Easy, Difficult, Preferred, Nonpreferred, Preferred. As children were scheduled for the study, they were assigned to either Order 1 or Order 2 by alternating assignments within age groups. Orders 1 and 2 were administered to 6 children and 5 children respectively in the 2-6 year age group, 6 and 4 children in the 7-11 year age group, and 13 and 14 children in the 12-22 year age group. The discrepancy in number of children assigned to the two orders in the 7-11 year age group was due to initial misinformation received regarding a child's age.

The activities were piloted with three children whose SIB frequencies were low enough to preclude their participation in Parts II and III of the study. Adjustments were made in verbal instructions to teachers and length of each condition as a result of these trial sessions.

Throughout the 30 minutes of activities, both adult and child behaviors were coded by an observer, utilizing a sequential event coding system. The observer carried a portable Sony tape recorder which emitted prerecorded sounds at 10 second intervals and interval numbers every 30 seconds. The interval sequence repeated every five minutes, allowing the observer to inform the teacher of the onset and termination of each condition. If necessary, the observer also informed the teacher of any errors in administration (deviations from standard instructions).

Instrumentation

Standard Series of Activities. The standard activities were designed to correspond to conditions thought to constitute major antecedents to SIB in the natural environment. Antecedent conditions were task difficulty, comprising an easy task and a difficult task, and task preference, comprising a preferred and a nonpreferred task. As can be seen in Table 10, the difficult and easy tasks were supplied by the investigator and remained constant for all children, whereas the preferred and nonpreferred tasks were idiosyncratic to each child.

The difficult and easy tasks were intended to accommodate the ability levels of the subject population as well as to embody those characteristics reported in the literature to be associated with task difficulty and listed in Table 11 (type of stimulus prompt, features, error rate, number of responses, etc.). Since tasks developed by other researchers did not meet minimum requirements for cognitive level (i.e., involved picture or letter discrimination beyond Sensori-Motor Stage III ability level), tasks were designed specifically for this study. Care was taken to equate tasks in terms of duration, attractiveness of materials, and minimum number of commands required (potentially needed for each of 12 responses). Additional requirements were that tasks be performable at multiple cognitive levels (to ensure continued interest of higher functioning children on the easy task and possible solution by trial and error on the difficult task), that tasks mimic difficulty levels found in classrooms (the easy task representing activity within child's ability, the difficult task corresponding to activities where the child does not understand what is expected), and that task instructions and performance be adaptable to various sensory and handicapping conditions.

The easy task materials were 12 rectangular blocks (3-3/4 x 1 x 1 inch balsa wood, painted yellow), 12 circular containers (2-1/4 x 2-1/4 inch containers glued to 4 x 4 inch cardboard, lightweight, painted black),

Table 10

Antecedent Conditions and Tasks for Standard Series of Activities

Antecedent Condition	Activity Type	Task Condition	Task Type
Task difficulty (low vs. high error rate)	Table task	Easy	Remove blocks from individual containers
		Difficult	Sequencing formboard
Task preference (preferred vs. nonpreferred task	Two of child's regular tasks or activities	Preferred Nonpreferred	Teacher's choice based on child's past behavior

Table 11

Characteristics of Easy and Difficult Tasks

	Task	
Differentiating Characteristics	Easy	Difficult
Stimulus prompts	intrastimulus	extrastimulus
Features	distinctive	nondistinctive
Error rate	low	high
Response	single	multiple
Difficulty level	sensori-motor Stage III	Beginning concrete operations
Solution	apparent	not apparent
Response required	visually directed grasp	sequencing

and a rectangular box (17 x 11 x 1-3/4 inch, painted black). Containers, each holding one block, were presented one at a time. Minimum performance required was grasping and removing the block.

The difficult task materials were a lightweight, 17 x 11 inch board with 12 equal partitions (3 across, 4 down) and 16 colored, wooden shapes (4 green circles, 4 red squares, 4 blue triangles, and 4 yellow hexagrams). Three model forms (circle, square, triangle) were glued across the top row of the board. Task materials were presented with the board facing the child and four shapes sequenced to the right of the board (circle, triangle, square, hexagon). The solution to the board was a repeated sequence of circle-square-triangle-hexagon (i.e., not matching forms). Acceptable performance was placing a form in any correct space on the board.

Observational Coding System. The observational coding system was modeled on Patterson's social interaction format (Reid, 1978) and allows for live coding of interactive sequences, blocked by 10-second intervals. A complete description of coding definitions, rules, and examples can be found in the manual, "Coding System for Self-Injurious Behavior in the Natural Environment" (Appendix M).

General categories of behaviors coded are as follows:

1. Positive, nonverbal social/communication behaviors are defined as deliberate and discrete behaviors directed toward a person or an object which serve or may be interpreted as serving a communicative function. The categories are based on nonverbal, positive behaviors thought to emerge sequentially within the sensori-motor period of development and include: simple behaviors directed toward objects, simple behaviors directed toward persons, complex behaviors directed toward objects, complex behaviors directed toward persons, transitional behaviors combining objects and persons, coordinated behaviors combining persons and objects, referential gestures, and vocalization (adapted from Bates, 1976, and Sugarman-Bell, 1978). Coordinated behavior, referential gesture, and vocalization are coded for adult as well as child.

2. Negative/manipulative behaviors are negativistic, noncompliant, or aggressive acts and serve such functions as avoidance, rejection, opposition, resistance, protest, or expression of displeasure or frustration. The four categories coded are negative motor-gestural, negative or destructive actions on objects, negative physical contact, and negative vocalization. Both negative action on object and negative physical contact are also coded for adult.

3. Symbolic social/communication includes verbal behavior which is minimally a one word utterance (speech acts) and gestural behavior which is clearly signing (universal signs). Positive codes are behavior request, information statement, information request, and signing; whereas negative codes are negative behavior request and negative information statement or request. All codes are applicable to both adult and child behavior.

4. Other first-order events and behaviors are additional, potential antecedents and/or consequents to SIB. Categories include environmental stimuli (environmental events which are accidental or are not intentionally directed to the child, coded as auditory, visual, or tactile/kinesthetic modalities), adult-peer interaction (adult interaction with or attention to other children), adult proximity (adult approaches or leaves vicinity of child), adult physical contact (physical contact directed by adult to the child), task presentation variables (adult manipulation of task materials utilizing visual, auditory, or tactile/kinesthetic modalities), task performance variables (correct, approximation, and error responses by the child), other child behaviors (discrete child actions not included in other categories), positive reinforcement (adult administered positive reinforcement), ignore (deliberate or intentional nonresponse to an adult or child initiated behavior), and restraint (adult or child initiated or terminated physical restraint).

5. Second-order behaviors are continuous behaviors that are utilized when none of the preceding codes are applicable. Categories include attention (watching or listening to other persons or events), work (engaging in teacher assigned or directed activity), independent and play activity (child initiated or chosen activity), unoccupied behavior, no response (behavior not directed to or perceived by another person), self-stimulation,

transitional behavior (walking during transitions between tasks or between activities), primary needs behavior (eating, sleeping, urinating), and seizure activity.

6. Self-injurious behaviors include topography categories of head-banging, biting self, face hitting, hair pulling, digging/scratching self, knee to head hitting, object to face hitting, kicking self, SIB threats, and other SIB.

A minimum of two behavioral acts were coded per 10 second interval. Behaviors or stimuli occurring within one second of each other and directed to the same person or object were defined as belonging to the same behavioral act or environmental event. Behaviors (or stimuli) occurring three seconds or more following a preceding behavior (or stimuli) were considered to be a new behavioral act or environmental event. New behavioral acts comprising first-order behaviors could be emitted by the same person or by the respondent. If no first-order behavior occurred three seconds following a preceding behavior, the respondent's second-order behavior was coded. Continuous behaviors were coded once per 10 second interval followed by the appropriate response. If more than two first-order behavior categories occur within a behavioral act, the two most relevant behaviors were coded. However, for coding of self-injurious behaviors, each discrete SIB was coded.

Whereas initiation and termination of restraint are coded as discrete behaviors, on-going adult applied and self-restraint behaviors were recorded as background conditions (rather than behavioral acts) for each interval during which they persisted. On-going physical contact was treated similarly.

Each behavioral act was preceded by an identification number corresponding to the source of the act. The target child was always #1, the teacher was #2, all other classroom aides were #3, peers in the class were #4, environmental events not visibly attributable to a person were #5, ancillary and non-classroom staff were #8, two or more persons responding to the child simultaneously were #9, and the observer was #0.

The onset of each activity condition and/or task was also entered, and the activity or task termination was inferred from entry of the next activity or task. The eleven activity conditions were daily living, group, educational, prevocational, gross motor, music, snack, bathroom, transitional, other (free time), and time out. Tasks within activities were specified in longhand and were assigned codes following observations.

The following is a sample interaction that occurred within the difficult standard activity: Teacher places task materials on table (visual task presentation, 2VT); child watches (attention, 1WT); adult says "Put in," while pointing to materials (behavior request and referential gesture, 2BR+CR); child places shapes in incorrect compartment (error, 1ER); adult removes shape and says "No, that's not where it goes" (visual task presentation and information statement, 2VT+IS); child hits cheek with palm of hand (face hit, 1FH). This sequence of events, divided by 10 second intervals, would be coded as:

2VT - 1WT	2BR - 1ER - 2VT - 1FH
	CR IS

Reliability

Two observers were trained by the investigator with the observational coding system over a period of two months. Training involved initial practice with videotapes followed by observation in classroom settings. Within each modality, observers first practiced with conditions involving simpler codes and minimal maladaptive behavior and gradually added practice with conditions involving complex coding and frequent maladaptive behavior.

Reliability to criterion was calculated for the investigator with each observer prior to spring data collection and with the first observer prior to fall data collection. Reliability calculations were based on the number of agreements and disagreements. Since unequal numbers of behaviors could be recorded per 10-second interval, behavioral acts or turns were utilized as the unit for agreement rather than intervals. Global measures of agreement were derived from the number of same turns (same behavioral act recorded) as well as the number of same turns with an identical behavior. Agreement for specific codes within general categories was also calculated.

Interobserver agreement, based on the last 60 minutes of observation preceding data collection (cumulative five minute intervals over two weeks) for investigator with observer 1 at time 1, investigator with observer 2 at time 1, and investigator with observer 1 at time 2, was 74%, 74%, and 76% for number same turns; and 72%, 72%, and 83% for number same behavior per same turn. Agreement for behavior codes within general categories was as follows: social/communication behavior - 84%, 88%, 93%; negative/manipulative behavior - 87%, 89%, 98%; symbolic social/communication - 76%, 73%, 96%; and SIB topography - 90%, 73%, 81%. First order events and behaviors which were coded reliably were task presentation - 98%, 95%, and 100%; task performance - 92%, 91%, and 73%; restraint- 100% (behaviors occurred at time 2 only); environmental stimuli - 100% (behaviors occurred with observer 2 only). Instances of certain first-order (adult approach, adult leave, adult-peer interaction) and second-order codes (unoccupied, self-stimulatory, walk, play, primary needs, and seizure behaviors) occurred so infrequently during practice sessions as to preclude reliability calculations. Lower percent agreement was obtained for first order codes of physical contact, praise, and ignore, and for second-order behaviors of watch, work, and no response. The previously mentioned condition of ongoing physical contact was introduced to remediate disagreements for the physical contact code. Praise was most often confused with information statement and occasionally with physical contact. And, finally, ignore, no response, and watch behaviors were interchangeably coded.

Part IV: Naturalistic Observation

Subjects

Subjects were eight children reported by teachers to be among highest rate SIBers within each age group and included two 2-6 year olds, three 7-11 year olds, and three 12-22 year olds. (Child characteristics are summarized in Table 12.) In addition, one 12-22 year old was observed at two time periods, i.e., in spring and in fall in two different classrooms. Of six additional children originally scheduled for observation, three were excluded due to low frequency SIB during the first days of observation (three 2-6 year olds, one 7-11 year old) and two could not be observed due to poor attendance or school closings during bad weather (one 7-11 year old, one 12-22 year old).

Procedure

Each child was observed in their natural environment at school for the first two hours of the school day (from approximately 9:00 - 11:30) to enable observation of educational tasks, group time, free time, and

Table 12

Child Characteristics for Naturalistic Observations

Age Group	Age in Months	Sex	Sensory Handicaps	Motor Involvement	Etiology
2-6 years	35	F	None	Ambulatory	Brain tumor
2-6 years	40	M	Myopic, recurrent otitis media	Delayed, crawl/ cruise	Unknown
7-11 years	103	M	Cortical blindness	Lower extremities severely involved, nonambulatory	Cerebral palsy
7-11 years	135	F	None	Hip dislocation, ambulatory	Unknown
7-11 years	141	M	None	Athetoid, lower extremities severely involved, upper extremities mildly involved, scoot	Cerebral palsy
12-22 years	153	M	None	Abnormal gait and fine motor control, ambulatory	Unknown
12-22 years	202	F	None	None, ambulatory	Unknown
12-22 years	206	F	Legally blind, profoundly deaf	None, ambulatory	Rubella syndrome

scheduled ancillary activities. Given that SIB can be variable across days, children were observed for four consecutive days. Monday through Thursday were chosen to capture behavior immediately after weekends and changes across days.

Teachers were requested to maintain the child's and classroom schedule as per usual. The observer followed the child unobtrusively, remaining close enough to see the child's behavior clearly while at the same time being able to scan the rest of the room. Interaction between the child and other persons in the room as well as occurrences of and reactions to environmental events were coded on standard observation sheets. The observer carried a portable tape recorder with earjack attachment which emitted a signal every 10 seconds and consecutive numbers of 30 second intervals within five minute blocks. The tape was rewound every 30 minutes, resulting in three brief breaks in sequential coding during each two-hour observation period.

Instrumentation

The Coding System for Self-Injurious Behavior in the Natural Environment, described in Part III Standard Activities, was also utilized during Part IV of the study.

Reliability

Observations for interobserver agreement were carried out in natural classroom settings. Reliability calculations are reported in Part III Standard Activities.

RESULTS

Part I: Survey

Prevalence

Program Response. The first step in determining the prevalence of SIB in the community is identification of programs serving SIBers. To obtain this information, a total of 55 service delivery systems, initially identified as potential service providers, were contacted, including 38 in Franklin County, 10 in Delaware County, and seven in Marion County. Of these, 11 systems identified SIBers in other programs, while 12 systems acknowledged providing ongoing, direct service to SIBers and agreed to participate in the study. Further breakdown of the 12 service delivery systems reveals 16 program units and 25 constituent schools serving SIBers. Table 13 outlines the overall response patterns of programs within each county, and Appendix N lists the actual programs and schools contacted and their responses.

Children identified. This identification and referral process unearthed 100 children, ages 2 to 22 years, whose behavior corresponded to the a priori definition of self-injurious behavior, and who were served by community programs or resided in the community. Of these 100 children, 31 were 2 to 6 years old, 17 were 7 to 11 years old, and 52 were 12 to 22 years old (one child, age unknown). Various programs for the mentally retarded or developmentally disabled served 75 of the SIBers; and the remaining 25 children were enrolled in programs for deaf/blind, visually

Table 13

Program Responses by County

Program and County	Program Response Number Contacted	Permission	Referral	No SIBers	No Response
Service Delivery Systems					
Franklin	38	10	8	13	7
Delaware	10	1	2	3	4
Marion	7	1	1	1	4
Total	55	12	11	17	15
Program Units					
Franklin	46	13	9	17	7
Delaware	10	1	2	3	4
Marion	8	2	1	1	4
Total	64	16	12	21	15
Schools					
Franklin	57	22	9	19	7
Delaware	10	1	2	3	4
Marion	8	2	1	1	4
Total	75	25	12	23	15
Classrooms					
Franklin	56	47	-	-	9
Delaware	3	3	-	-	0
Marion	5	5	-	-	0
Total	64	55	-	-	9

handicapped/multiply handicapped, hearing handicapped, emotionally disturbed/behavior disordered, autistic, and normal (day care) children. (See Table 14 for breakdown by program type and primary disability served.) In addition, the SIBers were placed in 64 different classrooms within these programs.

The prevalence of SIB also may be viewed in terms of the proportion of SIBers out of total children served by given community programs. Utilizing most recent figures available (from State of Ohio Department of Mental Health and Mental Retardation Annual Financial and Statistical Report Fiscal Year 1980), Table 15 shows the prevalence of SIB within county school and workshop programs. Across the three counties combined, the average percentage of children exhibiting SIB within county early childhood and school age programs is 6%, and the average percentage of SIBers 22 years of age or younger within county workshops is 4%.

Program and/or parent permission was obtained for 82 of the 100 identified SIBers. The remaining 18 children were excluded for the following reasons: written parental refusal (one); whereabouts unknown (one); no parental response (three); program denial or lack of response (two); program refusal or failure to refer low rate SIBers (three); and no teacher response (three). As is evident from Table 16, the vast majority of these children were referred due to hand biting behavior and were reported to engage in infrequent SIB.

Table 14

Number of SIBers by Program Type,

Primary Disability Served, and Number of Schools

	Program Type[a]							
	Hometraining/ Outpatient		Early Childhood		School Age		Workshop	
Disability[b]	Schools	N	Schools	N	Schools	N	Schools	N
MR/DD	3	(3)	4	(15)	7	(49)	3	(8)
D/B	0	(0)	0	(0)	1	(7)	0	(0)
VH/MH	0	(0)	1	(2)	1	(2)	0	(0)
HH	0	(0)	1	(1)	0	(0)	0	(0)
ED/BD	2	(2)	1	(4)	1	(1)	0	(0)
Autistic	0	(0)	0	(0)	1	(4)	0	(0)
Normal	0	(0)	2	(2)	0	(0)	0	(0)
Total	5	(5)	9	(24)	11	(63)	3	(8)

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[a] Program type is the primary service provided by a school or program.

[b] Disability is the primary disability served by a school or program unit; MR/DD=mentally retarded/developmentally disabled; D/B=deaf/blind; VH/MH=visually handicapped/multi-handicapped; HH=hearing handicapped; ED/BD=emotionally disturbed/behavior disorder.

Table 15

Prevalence of SIB Within County Programs

County Programs[b]	Enrollment Characteristics Number SIBers	Average Enrollment[a]	Percent SIBers
Franklin County			
FCBMR/DD Early Childhood	15	262	6%
FCBMR/DD School Age	44	637	7%
FCBMR/DD ARCraft Industries	4	104	4%
Delaware County			
Hickory Knolls School	4	48	8%
Marion County			
MARCA School	2[c]	104	2%
MARCA Industries	4	110	4%

[a] Enrollment figures were obtained from the State of Ohio Department of Mental Health and Mental Retardation Annual Financial and Statistical Report Fiscal Year 1980.

[b] Program abbreviations are as follows: FCBMR/DD=Franklin County Board of Mental Retardation and Developmental Disabilities; MARCA=Marion County Board of Mental Retardation.

[c] Comparatively lower SIB figures for Marion County are due to withdrawal from MARCA School of three SIBers immediately prior to data collection.

Table 16

Characteristics of SIBers Excluded From Data Collection

Child	Sex	Age Group	SIB Topography[a]	Rate
1	M	12-22 years	hand bite	low
2	M	7-11 years	hand bite	low
3	F	2-6 years	hand bite	low
4	M	12-22 years	face hit	low
5	M	7-11 years	unknown	unknown
6	F	12-22 years	hand bite	low
7	M	2-6 years	hand bite	unknown
8	F	7-11 years	hand bite	low
9	M	2-6 years	hand bite	low
10	F	2-6 years	head bang	unknown
11	M	12-22 years	face hit	high
12	M	12-22 years	hand bite	low
13	M	12-22 years	hand bite	low
14	M	12-22 years	hand bite	low
15	M	12-22 years	hand bite	low
16	M	12-22 years	hand bite	low
17	M	12-22 years	hand bite	low
18	F	unknown	head bang	low

[a] Topography listed is derived from initial referral sheet and may underestimate number of topographies in child's repertoire.

SIB Teacher Perception Questionnaire and Parameters of SIB

The SIB Perception Questionnaire was completed by present teachers for 77[1] children. Of these, 26 were 2 to 6 years old (mean age=52.6 months, S.D.=18.1, range=23-83); 14 were 7 to 11 years old (mean age=113.1 months, S.D.=18.9, range 87-141); and 37 were 12 to 22 years old (mean age=207.0 months, S.D.=36.3, range=150-278).

Information concerning behavior in prior classrooms was obtained for 15 children, including one 2-6 year old (age last taught by past teacher= 42 months), two 7 -11 year olds (age last taught by past teacher=82 and 94 months), and 12 12-22 year olds (mean age first served by past teacher= 193.3 months, S.D.=36.9, range=148-270). For two of the 12-22 year olds, questionnaires were also completed by additional teachers resulting in information concerning behavior at 193, 196, and 202 months of age for one child; and 198, 209, and 224 months of age for the second child.

Utilizing the criteria for inclusion or exclusion in Parts II and III, 46 children with present teacher information were identified as high rate and 27 as low rate. An additional four children qualifying but unavailable for Parts II and III were excluded from groupings. The high rate group comprised 11 2-6 year olds (mean age=56.1 months, S.D.=18.1, range=28-83); 10 7-11 year olds (mean age=111.7, S.D.=16.9, range=87-141);

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[1] Although survey information was obtained for 82 children, teachers of two children completed the card sort and ABS but did not return the questionnaire, parent but not teacher completed the questionnaire for one child, and past teachers only responded for two children.

and 25 12-22 year olds (mean age=202.3 months; S.D.=31.6, range=150-268 months). The low rate group included 13 2-6 year olds (mean age=48.5 months, S.D.=16.8, range=23-79); four 7-11 year olds (mean age=116.5 months, S.D.=26.0, range=88-139); and 10 12-22 year olds (mean age=213.2 months, S.D.=44.5, range=164-278). As compared to the overall group, average age in months is no more than ± 6 months at each age level (see Table 17). High rate SIBers also tended to be slightly older than low rate SIBers within the youngest age group with the opposite pattern occurring in the two older age groups. Additionally, virtually all SIBers identified in the outlying counties (Delaware and Marion) were high rate, with the exception of two individuals placed in the Marion County workshop.

When age in months is converted to years, as shown in Table 18, children appear to be distributed across the entire age range, although fewer persons were reported within the 18-23 year age range. This may be due to the fact that most low functioning SIBers would not qualify for workshop placement other than in the more recently developed prevocational units.

Consistent with findings for all children identified, almost three-fourths of the overall, high rate, and low rate groups were male, with 72%, 71%, and 74% respectively. However, proportionately more females within the 12-22 year age range were assigned to the high rate group; i.e., 37% receiving and 38% qualifying for Part III of the study.

Frequency of SIB. Due to the small number of subjects within Delaware and Marion Counties, all further descriptive information and statistical analyses were calculated for all three counties combined.

Table 17

Mean Chronological Age in Months for SIB Teacher Perception Questionnaire by Age Group and County for High Rate, Low Rate, and All SIBers Combined

	Age Group								
	2-6 years			7-11 years			12-22 years		
Group and County	(N)	Mean	S.D.	(N)	Mean	S.D.	(N)	Mean	S.D.
All SIBers	(26)	52.6	18.1	(14)	113.1	18.9	(37)	207.0	36.3
Franklin	(25)	53.1	18.3	(12)	114.6	19.6	(31)	198.7	32.3
Delaware	(1)	40.0	0.0	(1)	115.0	0.0	(1)	211.0	0.0
Marion	(0)	-	-	(1)	93.0	0.0	(5)	256.0	20.7
High Rate Group	(11)	56.1	18.1	(10)	111.7	16.9	(25)	202.3	31.6
Franklin	(10)	57.7	18.2	(8)	113.6	17.6	(22)	198.1	30.0
Delaware	(1)	40.0	0.0	(1)	115.0	0.0	(1)	211.0	0.0
Marion	(0)	-	-	(1)	93.0	0.0	(2)	244.0	33.9
Low Rate Group	(13)	48.5	16.8	(4)	116.5	26.0	(10)	213.2	44.5
Franklin	(13)	48.5	16.8	(4)	116.5	26.0	(8)	200.6	40.3
Delaware	(0)	-	-	(0)	-	-	(0)	-	-
Marion	(0)	-	-	(0)	-	-	(2)	263.5	9.2

Table 18

Age Distribution in Years for
SIB Teacher Perception Questionnaire for
High Rate, Low Rate, and All SIBers Combined

Age	All SIBers	High Rate Group	Low Rate Group
1	1	0	1
2	4	2	2
3	5	2	2
4	7	2	5
5	4	2	2
6	5	3	1
7	3	2	1
8	3	2	1
9	4	4	0
10	0	0	0
11	4	2	2
12	2	2	0
13	4	2	2
14	2	1	1
15	4	3	1
16	8	5	2
17	5	5	0
18	2	2	0
19	1	1	0
20	3	2	1
21	2	1	1
22	3	1	1
23	1	0	1

Of initial interest is the frequency with which SIB is perceived to occur within the classroom. For the group as a whole, the average lowest frequency reported is 5.1 SIB per hour, and the mean highest frequency is 69.2 SIB. Although high variability within age groups precludes any significant differences among the groups, certain trends are evident. First, both the means and upper limits of both the lowest and highest frequency observed increase with age. In addition, the range of frequency (difference between lowest and highest frequency observed) increases with age. The mean frequencies reported at each age level are noted in Table 19, and the age group functions of highest frequency are depicted in Figure 1.

The same patterns observed for the group as a whole obtain for SIBers in the high rate but not the low rate group. (See Table 19 and Figure 2 for mean SIB and highest frequency distribution.) In the latter, both the means and distributions of SIB frequencies are similar across age groups with the exception of a relatively depressed mean for high frequency for the 7-11 year old group.

Individuals also tend to be perceived by current teachers as maintaining the same level of SIB relative to other members of the group. Measures which reflect this stability of severity are the relationship between present low and high frequencies (0.53, $p < .0001$), between past school year and present school year low frequencies (past 2-6 year with present=0.86, $p < .0001$, N=10; past 12-22 year with present=0.72, $p < .0001$, N=23), and between past school year and present school year high frequencies (past 2-6 years with present=0.84, $p < .003$, N=10;

Table 19

Lowest and Highest Frequencies of SIB as Perceived by Teachers

Group and SIB Frequency Measure	Age Group[a] 2-6 years Mean	S.D.	7-11 years Mean	S.D.	12-22 years Mean	S.D.
Overall						
Lowest	1.9	(5.4)	8.3	(16.6)	6.2	(18.7)
Highest	20.4	(26.4)	53.0	(56.8)	111.9	(248.0)
Difference	18.5	(24.9)	44.7	(43.8)	103.6	(235.4)
High Rate						
Lowest	4.1	(8.4)	11.6	(18.8)	8.5	(22.2)
Highest	41.9	(28.1)	74.0	(54.2)	157.0	(287.6)
Difference	37.8		62.4		148.5	
Low Rate						
Lowest	0.32	(1.11)	0.01	(0.0)	0.24	(0.52)
Highest	4.3	(8.2)	0.51	(0.32)	4.7	(9.0)
Difference	3.98		0.50		4.46	

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[a] Number of subjects for overall group=77, for high rate group=46, and for low rate group=27.

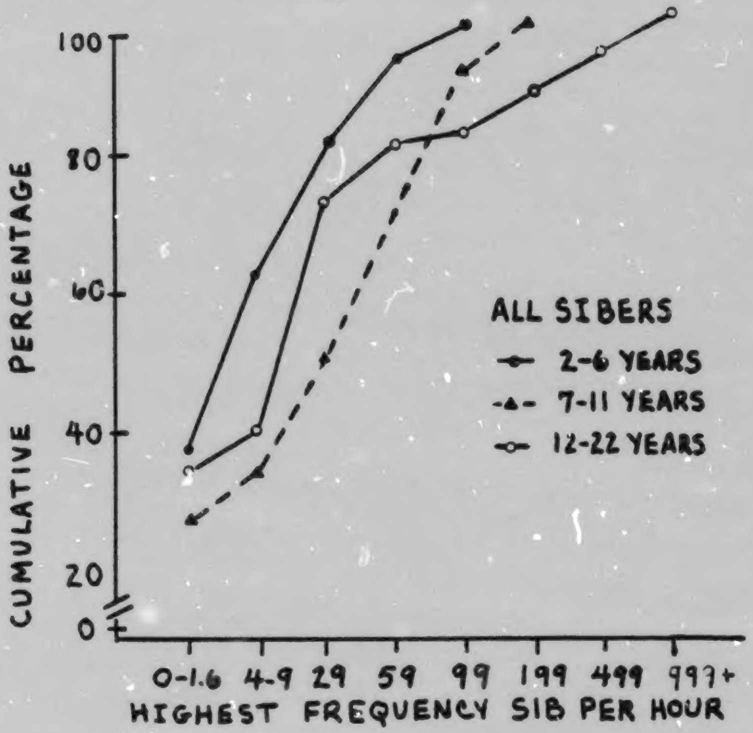

Figure 1. Highest Frequency SIB Reported by Teachers for All SIBers.

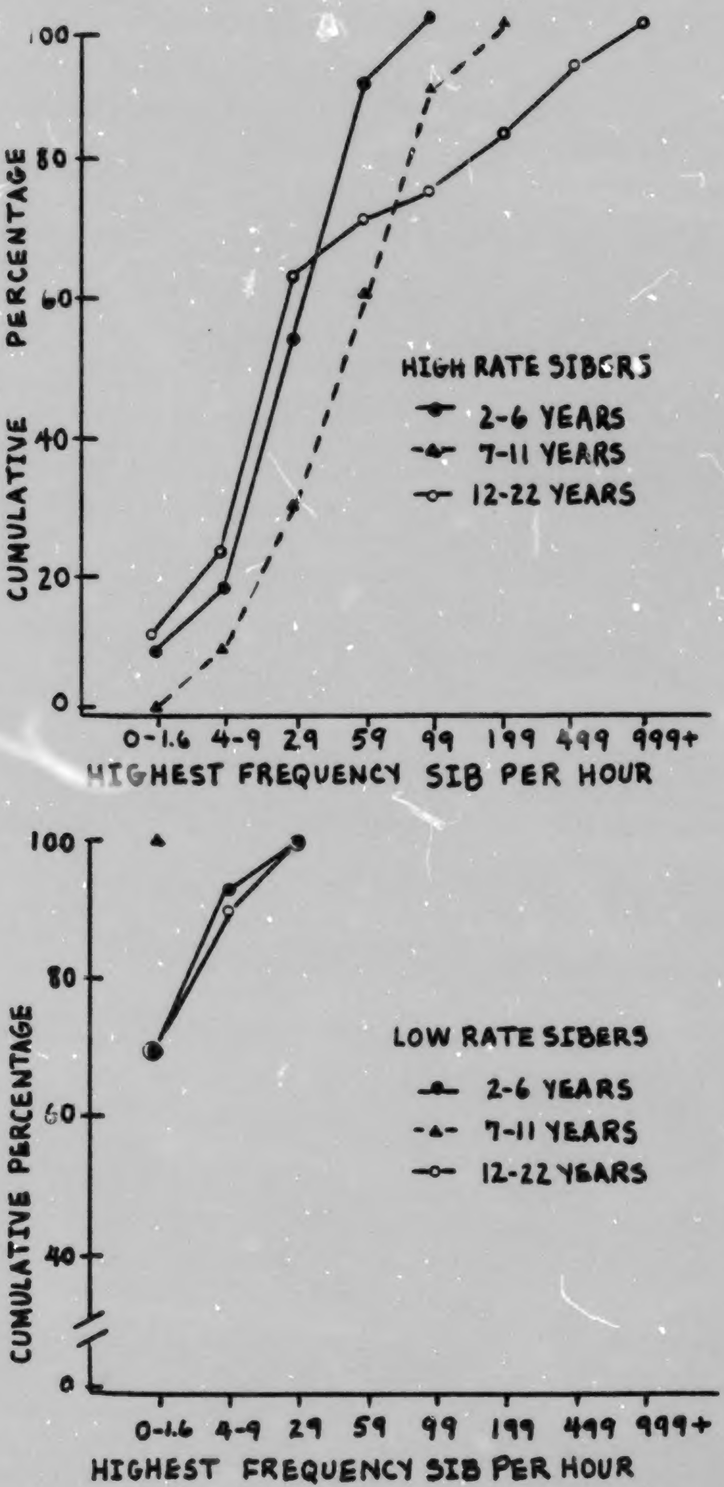

Figure 2. Highest Frequency SIB Reported by Teachers for High Rate and Low Rate Groups.

past 7-11 years with present=0.999, $p < .0001$, N=7; and past 12-22 years with present=0.74, $p < .0001$, N=23).

A second source of information regarding stability of SIB frequency can be obtained by comparing frequencies reported by past teachers with those reported by present teachers. Although number of children with past teacher questionnaires reflect only one-fifth of the group, their average SIB frequencies correspond to those obtained for present age groups. In addition, both past and present teachers report similar average frequencies on SIB measures (see Table 20) with slight decrease in average frequency over time. However, analysis of individual subject data reveals that this apparent consistency is illusory, resulting from approximately half the children engaging in less and about half the children exhibiting more SIB at present than in the past (lowest frequency=6 improve, 6 same, 4 worse; highest frequency=6 improve, 2 same, and 8 worse; and difference between lowest and highest frequency=6 improve, 1 same, 9 worse).

Topography of SIB. The second parameter investigated is topography of SIB. For the 10 general topographies, the average number reported per child is 2.8 (S.D.=1.5), and the average number per age group is 2.4 (S.D.=1.1) for the 2-6 year olds, 3.1 (S.D.=1.6) for 7-11 year olds, and 2.9 (S.D.=1.6) for 12-22 year olds. As with SIB frequency, although no significant age differences emerged, the upper limits of number of topographies per child also increase with age (see Figure 3).

However, when high rate and low rate SIBers are compared, the high rate SIBers exhibit more general topographies overall (mean=3.0, S.D.=1.4) and at each age level than do low rate SIBers overall (mean=2.1, S.D.=1.1) or at corresponding age levels (see Table 21). Consistent with

Table 20

SIB Frequency Reported by Past and Present Teachers

SIB Frequency Measure	Past Teacher		Present Teacher		Difference[a]	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Lowest	6.6	(9.7)	8.4	(25.2)	1.77	(20.7)
Highest	114.0	(250.0)	109.2	(170.9)	-4.49	(309.9)
Difference	107.4	(243.2)	100.8	(145.7)	-13.27	(296.8)

Note. Number of children with both past and present teacher questionnaire= 15.

[a] Numbers with positive signs indicate increased frequency from past to present, and numbers with negative signs indicate decreased frequency from past to present.

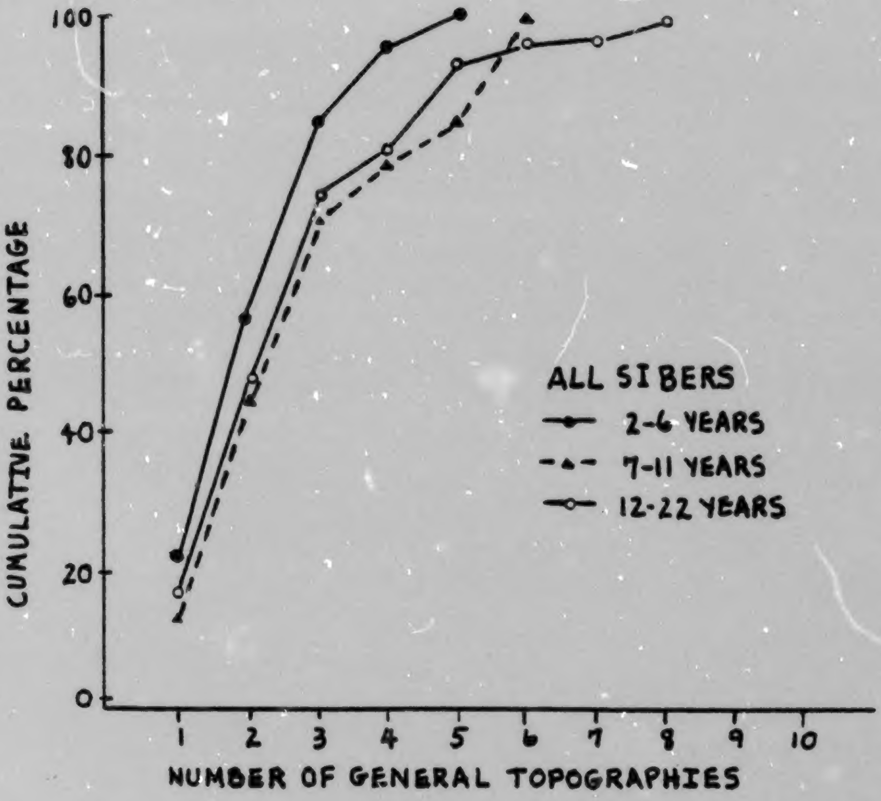

Figure 3. Number of General Topographies Reported by Teachers for All SIBers.

Table 21

Mean Number of Topographies Reported by Teachers for High Rate, Low Rate, and All SIBers Combined

Group and Topography Measure	2-6 years Mean	2-6 years S.D.	7-11 years Mean	7-11 years S.D.	12-22 years Mean	12-22 years S.D.
Overall						
General topographies	2.4	(1.1)	3.1	(1.6)	2.9	(1.6)
Topography subtypes	3.2	(1.7)	4.0	(2.6)	3.6	(1.9)
High Rate						
General topographies	2.8	(0.8)	3.2	(1.9)	3.0	(1.4)
Topography subtypes	3.9	(1.6)	4.3	(2.9)	3.8	(1.9)
Low Rate						
General topographies	1.9	(1.0)	2.8	(1.0)	2.2	(1.2)
Topography subtypes	2.5	(1.3)	3.3	(1.3)	2.6	(1.2)

findings concerning SIB frequency, high rate SIBers also show a higher upper limit of number of topographies and these limits increase with age (see Figure 4).

Based on present/absent scores for each general topography, the order from most to least frequently reported is: face hitting (N=51); biting self (N=47); head banging (N=39); other SIB (N=30); digging/scratching self (N=15); hair pulling (N=13); object to face hitting (N=6); eye poking (N=6); knee to head hitting (N=4), and kicking self (N=3). The number of children by age group exhibiting each topography is entered in Table 22.

Although head banging, biting self, and face hitting continue to be among the top ranking topographies within age groups for both high rate and low rate SIBers, the two groups are distinguished by the more frequent presence of other SIB in the high rate group (half the group) and its relative absence in the low rate group (14%); stepwise discriminant function $\underline{F}$ (2,71) = 5.77, $\underline{p} < .001$: Group = 2.0965(SB) - 0.83436, where group 1 = high rate and group 2 = low rate. Use of simultaneous discriminant analysis further improved assignment to groups; $\underline{F}(10,62)=2.27$, $\underline{p} < .05$.

Consideration of actual topography combinations underscores the high proportion of children exhibiting multiple topographies. As shown in Table 23, of only 14 children exhibiting one topography, biting self is most frequent within each age group. For children engaging in two topographies (N=22, 30% of all SIBers), the combination of head banging and biting self is most frequent in 2-6 year olds, whereas biting self and face hitting are most frequently reported for the two older groups. When three topographies are considered (N=21, 28% of all SIBers), head banging

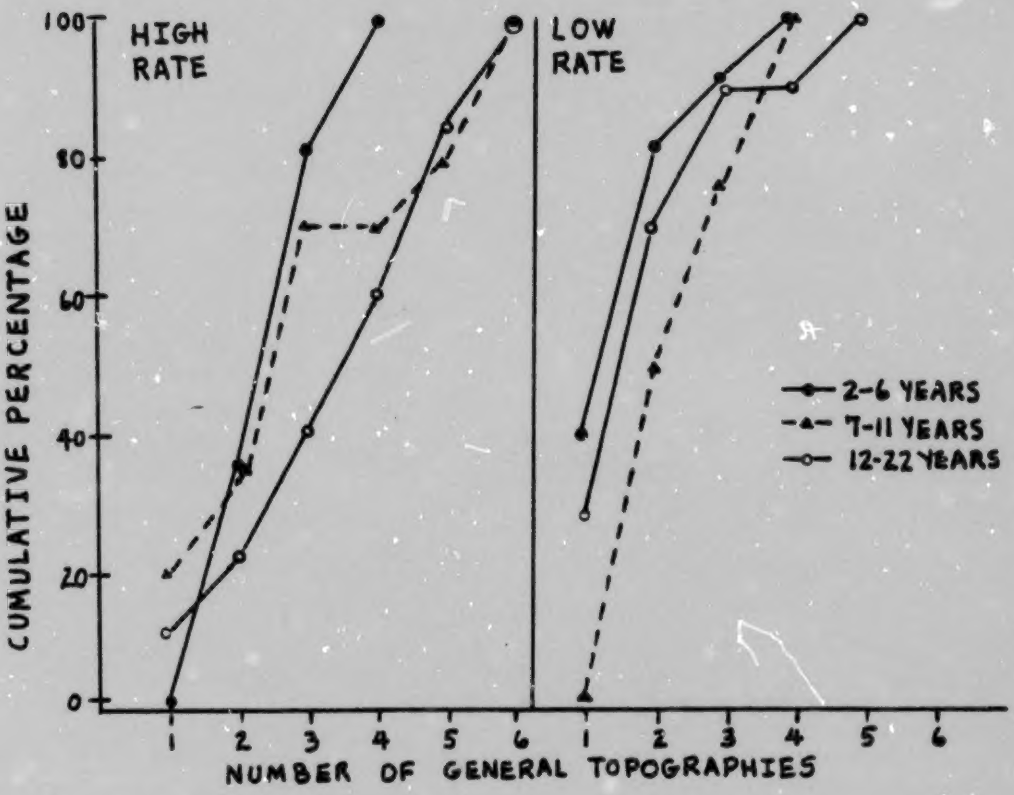

Figure 4. Number of General Topographies Reported by Teachers for High Rate and Low Rate SIBers.

Table 22

Number of Children With Each General Topography
as Reported by Teacher by Age Group and Rate Group

Rate and		General Topographies									
Age Group	(N)	HB	BS	FH	HP	DS	KH	OF	KS	EP	SB
Overall											
2-6 years	(26)	13	13	14	6	5	0	1	0	1	8
7-11 years	(14)	9	8	12	3	2	1	3	0	0	6
12-22 years	(37)	17	26	25	4	8	3	2	3	5	16
Total		39	47	51	13	15	4	6	3	6	30
High Rate											
2-6 years	(11)	7	6	7	1	1	0	2	0	1	6
7-11 years	(10)	6	7	8	2	0	1	2	0	0	5
12-22 years	(25)	12	17	17	2	6	3	2	2	3	12
Total		25	30	32	5	7	4	6	2	4	23
Low Rate											
2-6 years	(13)	5	5	6	4	3	0	0	0	0	2
7-11 years	(4)	3	1	3	1	2	0	0	0	0	1
12-22 years	(10)	4	7	6	1	1	0	0	0	0	2
Total		12	13	15	6	6	0	0	0	0	5

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[a] HB=head banging, BS=biting self, FH=face hit, HP=hair pull, DS=digging/scratching/pinching self, KH=knee to head hitting, OF=object to face hitting, KS=kicking self, EP=eye poking, SB=other SIB.

Table 23

Number of Children with Each Topography Combination by Age Group for All SIBers

General Topography Combinations[a]	Age Group (in years) Overall	2-6	7-11	12-22
One topography				
HB	1	1	0	0
BS	7	3	1	3
FH	5	2	1	2
SB	1	0	0	1
(Total)	(14)	(6)	(2)	(6)
Two topographies				
HB+BS	4	3	0	1
HB+FH	3	1	1	1
HB+HP	1	1	0	0
HB+EP	1	0	0	1
HB+SB	1	0	1	0
BS+FH	5	0	2	3
BS+DS	3	1	0	2
BS+SB	4	1	0	3
(Total)	(22)	(7)	(4)	(11)
Three topographies				
HB+BS+FH	4	0	1	3
HB+FH+KH	1	0	0	1
HB+FH+SB	6	3	2	1
HB+FH+OF	1	1	0	0
HB+HP+DS	2	1	1	0
HB+DS+SB	1	0	0	1
BS+FH+EP	1	0	0	1
BS+FH+SB	2	1	0	1
FH+HP+SB	1	1	0	0
FH+OF+SB	1	1	0	0
FH+EP+SB	1	0	0	1
(Total)	(21)	(8)	(4)	(9)
Four topographies				
HB+BS+FH+HP	1	1	0	0
HB+BS+FH+DS	2	0	1	1
HB+BS+FH+EP	1	1	0	0
HB+FH+KH+SB	1	0	0	1
(Total)	(5)	(2)	(1)	(2)
Five topographies				
HB+BS+FH+HP+DS	2	1	0	1
HB+BS+FH+HP+OF	1	0	0	1
HB+BS+FH+HP+SB	1	0	0	1
HB+BS+FH+DS+SB	1	0	0	1
HB+BS+FH+OF+SB	1	0	1	0
HB+BS+FH+EP+SB	1	0	0	1
BS+FH+DS+KS+SB	1	0	0	1
(Total)	(8)	(1)	(1)	(6)

Table 23 (Continued)

General Topography Combinations[a]	Age Group (in years)			
	Overall	2-6	7-11	12-22
Six topographies				
HB+BS+FH+HP+KH+SB	1	0	1	0
HB+BS+FH+HP+OF+SB	1	0	1	0
BS+FH+KH+OF+KS+SB	1	0	0	1
(Total)	(3)	(0)	(2)	(1)
Seven topographies				
None	0	0	0	0
(Total)	(0)	(0)	(0)	(0)
Eight topographies				
HB+BS+FH+HP+DS+KS+EP+SB	1	0	0	1
(Total)	(1)	(0)	(0)	(1)

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[a] HB=head banging; BS=biting self; FH=face hitting; HP=hair pulling; DS=digging/scratching/pinching self; KH=knee to head hitting; OF=object to face hitting; KS=kicking self; EP=eye poking; SB=other SIB.

plus face hitting plus other SIB (SB) is the most frequent combination in the two youngest groups, and head banging plus biting self plus face hitting is most frequent for the oldest group. Another way of viewing this same data is to note which single topography occurs most often in conjunction with two other topographies; i.e., face hitting with two other topographies (N=19), followed by head banging (N=14) and biting self (N=7).

The remaining 23% of SIBers are reported to exhibit four or more general topographies, with one child engaging in eight topographies. At the level of four topographies (N=5), all but one child combined head banging, biting self, and face hitting with one other topography. In larger combinations of SIB, these three topographies were usually present along with either hair pulling or other SIB in conjunction with miscellaneous additional categories.

In addition to knowing what combinations of topographies coexist within individuals' repertoires, the hierarchy of occurrence of these SIBs is also of interest. The question answered here is, overall, in which behaviors is a child most often and least often perceived to engage. As can be seen from Table 24 (overall and age group rankings), face hitting or biting self are perceived most often as the highest probability topographies, followed by other SIB and head banging.

A more complete description of topography can be obtained by subdividing the 10 general categories into subtypes based on body parts used, body parts contacted, and objects or persons contacted. The number of children reported and the percentages of total entries for each topography subtype are listed in Table 25. Within each general category,

Table 24

Hierarchy of SIB Topographies Reported by Teachers for Present School Year

Age Group	Rank[a]	General Topography[b] HB	BS	FH	HP	DS	KH	OF	KS	EP	SB
Overall	1	11	23	25	1	6	-	2	-	1	12
	2	16	10	16	5	2	-	1	2	2	5
	3	7	8	6	1	2	3	-	-	1	6
	4	3	-	1	2	4	-	1	1	1	1
	5	-	2	-	1	-	1	1	-	-	2
	6	1	1	-	-	-	-	1	-	-	-
2-6 years	1	4	7	8	1	2	-	2	-	-	5
	2	4	3	4	4	1	-	-	-	-	1
	3	5	2	1	-	1	-	-	-	-	-
	4	-	-	1	1	-	-	-	-	-	1
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	1	-
7-11 years	1	4	4	4	-	1	-	-	-	-	2
	2	2	2	5	1	-	-	-	-	-	1
	3	-	1	2	-	1	-	-	-	-	3
	4	2	-	-	1	-	-	1	-	-	-
	5	-	-	-	-	-	1	1	-	-	1
	6	1	1	-	-	-	-	1	-	-	-
12-22 years	1	3	12	13	-	3	-	-	-	1	5
	2	10	5	7	-	1	-	1	2	2	3
	3	2	5	3	1	-	3	-	-	1	3
	4	1	-	-	-	4	-	-	1	-	-
	5	-	2	-	1	-	-	1	-	-	1
	6	-	-	-	-	-	-	-	-	-	-

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[a] 1=most frequently occuring topography; 6=least frequently occurring topography; rankings include ties.

[b] HB=head banging; BS=biting self; FH=face hitting; HP=hair pulling; DS=digging/scratching/pinching self; KH=knee to head banging; OF=object to face hitting; KS=kicking self; EP=eye poking; SB=other SIB.

Table 25

Number of Children with Each Topography Subtype
as Reported by Teachers for All SIBers

General Topography and Subtype	N[a]	(Percent)[b]
Head banging		
Head to objects	37	(48.7)
Teeth to objects	1	(1.3)
Head to persons	9	(11.8)
Biting self		
Bite hand	34	(44.7)
Bite fingers	8	(10.5)
Bite arm	12	(15.8)
Bite foot	1	(1.3)
Bite clothing	6	(7.9)
Face hitting		
Face with open palm	22	(28.9)
Skull with open palm	10	(13.2)
Face with fist	11	(14.5)
Skull with fist	20	(26.3)
Head with upper arm	3	(3.9)
Hair pulling		
Hair pulling	12	(15.8)
Digging self		
Pinch self	7	(9.2)
Dig with nails	5	(6.6)
Scratch self	4	(5.3)
Knee to head hitting		
Bang knee to head	3	(3.9)
Bite knee	1	(1.3)
Object to face hitting		
Object to face/head	6	(7.9)
Kicking self		
Kick shin	2	(2.6)
Foot to foot press	1	(1.3)
Knee/leg to object	1	(1.3)
Eye poking		
Eye poking	6	(7.9)
Other SIB		
Knuckle to face	3	(3.9)
Hand press to face	4	(5.3)
Objects on head	3	(3.9)
Bite object	1	(1.3)
Ear pull/poke	6	(7.9)
Hit other body part	13	(17.1)
Hit objects with hand	6	(7.9)
Other	9	(11.8)

[a] N=76

[b] Percent represents percent of total number of subjects (76).

the most frequently reported subtype is: head to objects for head banging; hitting face with palm or skull with fist for face hitting; pinching self for digging/scratching self; banging knee to head for knee to head hitting; kicking shin with heel of foot for kicking self; and hitting other body part for other SIB. As is evident in Table 21, the age and rate group patterns found for other parameters also obtain for topography subtypes.

When subtypes were further content analyzed into topography variations, 94 variations emerged; i.e., more variations than children sampled by the present teacher questionnaire (see Appendix F). However, the actual distribution of children across variations should be viewed with caution as not all teachers described topographies in equal detail.

As with SIB frequency, changes in number of topographies with increasing age is of interest. A slight increase in average number of general topographies reported by present teachers for the present over prior school years is evident (derived from topography rankings). For the 2-6 year range, mean number of topographies during the present and past school years respectively is 2.4 (S.D.=1.1) and 1.9 (S.D.=1.4); whereas 3.1 versus 3.0 (S.D.=1.6) and 2.9 versus 2.8 (S.D.s=1.6, 1.5) were reported for the 7-11 and 12-22 year olds. Also, slightly more topography variations were acquired than were discontinued (mean number of new variations=0.27, S.D.=0.77; and mean number of variations discontinued=0.16, S.D.=0.63).

However, when questionnaire findings from past and present teachers are compared, the acquisition of new topographies over time is evident (see Table 26). Specifically, of the 15 children, six children acquired

Table 26

Mean Number of Topographies
Reported by Past and Present Teachers

Topography Measure and Age Group	Past Teacher		Present Teacher		Difference[a]	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
General topographies						
2-6 years	2.0	(0.0)	3.0	(0.0)	1.0	(0.0)
7-11 years	1.5	(0.7)	1.5	(0.7)	0.0	(0.0)
12-22 years	2.8	(1.4)	2.9	(1.4)	0.2	(1.3)
Topography subtypes						
2-6 years	3.0	(0.0)	5.0	(0.0)	2.0	(0.0)
7-11 years	2.5	(2.1)	1.5	(0.7)	-1.0	(1.4)
12-22 years	3.2	(2.0)	3.6	(2.0)	0.4	(2.1)
Topography variations						
2-6 years	4.0	(0.0)	6.0	(0.0)	2.0	(0.0)
7-11 years	2.5	(2.1)	1.5	(0.7)	-1.0	(1.4)
12-22 years	3.7	(2.8)	4.8	(3.2)	1.1	(3.3)

Note. Number of children with both past and present questionnaires is 1 for 2-6 year olds, 2 for 2-7 year olds, and 12 for 12-22 year olds.

[a] Positive numbers indicate increase in mean topographies from past to present, and negative numbers indicate decrease from past to present.

new general topographies, while six children retained their old topographies, and three children discontinued topographies. However, the increase in number of topographies becomes more striking when topography subtypes and variations are considered; i.e., seven children developed new subtypes, and eight children developed new variations.

Antedecents to SIB. As with frequency and topography measures, the number of immediate antecedents to SIB (of 13 common categories) reported does not discriminate among age groups; i.e., for 2-6 year olds, mean=4.2, S.D.=2.7; for 2-7 year olds, mean=5.3, S.D.=3.1; and for 12-22 year olds, mean=5.3, S.D.=2.4. When the presence or absence of each of the 13 antecedents is considered, only change in routine is reported as present significantly more often with increasing age (15% of 2-6 year olds, 36% of 7-11 year olds, and 78% of 12-22 year olds) and is associated with age group membership [stepwise discriminant analysis F (2,72) = 5.409, $p < .01$; discriminant equation = -2.15783 (Routine) + 0.83436].

As outlined in Table 27, behavior requests by adults, unsuccessful task performance by child, and adult attempts to stop self-stimulatory or other inappropriate behaviors are reported most often as preceding self-injurious behavior within the 7-11 and 12-22 year age groups. Within the 2-6 year age group, unsuccessful task performance is replaced by being left alone as among the three most frequent antecedents. These age group patterns are maintained when the relative frequency with which each category precedes SIB is considered (see Table 28). Conversely, the least frequently occurring antecedents were any adult speech (regardless of content or function), child engaging in a desired behavior, and unexpected sounds or movements.

Table 27

Percent of Children with Each Antecedent to Self-Injurious Behavior

		Age Group		
Antecedents	Overall	2-6 years	7-11 years	12-22 years
Unexpected sounds/movements	24	23	36	19
Specific behavior requests	72	65	64	81
Any adult speech	17	19	14	17
Adult approach	25	19	36	25
Child left alone	45	50	50	39
Adult touch	33	23	43	36
Approach areas	33	27	29	39
Desired behaviors by child	18	15	29	16
Unsuccessful task performance	51	39	50	60
Change in routines	38	15	36	54
Adult stop other inappropriate behavior	66	54	57	57
No reason	46	35	50	51
Other	38	42	36	35

Note. Numbers represent percent of children out of total children for each antecedent; total number of children for 2-6 year age group=26, for 7-11=14, and for 12-22=36.

Table 28

Mean Scores by Age Group
for Antecedents to Self-Injurious Behavior

	Age Group					
	2-6 years		7-11 years		12-22 years	
Antecedents	Mean	S.D.	Mean	S.D.	Mean	S.D.
Unexpected sounds/ movements	0.35	(0.69)	0.50	(0.76)	0.25	(0.55)
Specific behavior requests	1.04	(0.87)	0.86	(0.77)	1.31	(0.79)
Any adult speech	0.19	(0.40)	0.14	(0.36)	0.17	(0.38)
Adult approach	0.31	(0.68)	0.36	(0.50)	0.28	(0.51)
Child left alone	0.73	(0.83)	0.64	(0.74)	0.50	(0.70)
Adult touch	0.31	(0.62)	0.50	(0.65)	0.47	(0.70)
Approach areas	0.38	(0.70)	0.43	(0.76)	0.42	(0.55)
Desired behavior by child	0.27	(0.67)	0.43	(0.76)	0.22	(0.53)
Unsuccessful task performance	0.65	(0.89)	0.79	(0.89)	0.78	(0.75)
Change in routines	0.15	(0.37)	0.43	(0.65)	0.70	(0.74)
Adult stop other inappropriate behavior	0.77	(0.82)	0.86	(0.86)	0.76	(0.76)
No reason	0.46	(0.71)	0.64	(0.74)	0.65	(0.72)
Other	0.72	(0.89)	0.50	(0.76)	0.54	(0.80)

Also consistent with frequency and topography results, approximately twice as many antecedent categories are reported to precede SIB within the high rate group (mean=5.9, S.D.=2.5) than in the low rate group (mean=3.1, S.D.=2.2). Through simultaneous discriminant analysis, 82% of SIBers would be correctly assigned to the two rate groups; $F(12,58)=3.77$, $p < .001$, discriminant equation: Rate group = 0.25 (ES) - 0.50 (BR) - 0.07 (SP) + 0.51 (AP) + 0.42 (ER) + 0.05 (Routine) + 1.26 (SS/NP) + 1.11 (no reason) - 0.27 (other) - 1.53.[1]

Of the antecedents significantly discriminating between the rate groups (initially identified through stepwise discriminant analyses [$F(4,66)=11.03$, $p < .001$], three were more frequently reported for the high rate group (ER, CB, and no reason), and "other" was more frequently reported within the low rate group. As evident in Table 29, behavior requests, unsuccessful task performance, and attempts to stop inappropriate behavior continue to be the most frequently occurring antecedents within the high rate group, whereas attempts to stop inappropriate behavior is replaced by "other" in the low rate group. Events and behaviors noted as "other" by teachers of low rate children included physical discomfort (headache, urinary tract infection, tired, awakened from nap), physical contact by peers, "time out," preferred activity is stopped or refused, and argument with an imaginary person, etc.

Parallel to findings for SIB frequency, the apparent stability of number of antecedents to SIB perceived by past and present teachers

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[1] ES=environmental sounds or movements, BR=behavior requests by adult, SP=any adult speech, AP=adult approach, PC=physical contact by adult, TR=approach certain areas or places, CB=child engages in a desired behavior, ER=unsuccessful task performance by child, Routine=change in familiar routines, SS/NP=adult stops self-stimulatory or other inappropriate behavior.

Table 29

Mean Scores by Rate and Age Group for Antecedents to SIB

	2-6 years		7-11 years		12-22 years	
Antecedents	High	Low	High	Low	High	Low
Unexpected sounds/movements	0.64	0.08	0.70	0.00	0.25	0.20
Specific behavior requests	1.20	0.85	0.90	0.75	1.38	1.10
Any adult speech	0.27	0.08	0.20	0.00	0.17	0.20
Adult approach	0.72	0.00	0.40	0.25	0.38	0.10
Child left alone	0.72	0.69	0.80	0.25	0.63	0.10
Adult touch child	0.64	0.08	0.50	0.50	0.50	0.30
Approach areas	0.72	0.15	0.60	0.00	0.54	0.10
Desired behavior by child	0.45	0.15	0.60	0.00	0.32	0.00
Unsuccessful task performance	1.00	0.31	0.80	0.75	0.92	0.50
Change in routines	0.09	0.23	0.60	0.00	0.80	0.30
Adult stop other inappropriate behavior	1.27	0.38	1.10	0.25	1.00	0.30
No reason	0.82	0.15	0.80	0.25	0.72	0.40
Other	0.40	0.92	0.40	0.75	0.60	0.50

(mean=5.5, S.D.=2.4 and 2.7 respectively) actually results in equal numbers of children responding to more or fewer antecedents (7=more antecedents at present, 6=fewer antecedents, 2=no change). In addition, the direction of change across parameters is inconsistent within individual children; e.g., children who increase topographies or antecedents may show a decrease in SIB frequency.

Interrelationships among parameters. For the overall group, multivariate analysis revealed no significant differences between age groups (MANOVA) or relative to actual chronological age in months (canonical correlation) for lowest SIB frequency, highest frequency, number of antecedents, or number of topographies. Although number of antecedents and number of general topographies also were unrelated to teachers' perceptions of highest SIB frequency, they did predict lowest frequency; $F(5,71)=2.67$, $p < .03$. One possible explanation for this discrepancy may be that children's relative standing on the lowest frequency measure corresponds to their relative average frequencies (and, therefore, severity of SIB), whereas perceptions of highest frequency are not necessarily as closely related to usual SIB frequencies. As can be seen below, number of antecedents account for most of the variance (24%) in the multiple regression equation: Low frequency=2.21 (number general topographies since September) + 1.21 (number antecedents) + 0.98 (number specific topographies) + 0.18 (number topography types) - 0.90 (number general topographies).

Analysis of lowest and highest frequency measures with the 13 general antecedents yielded two significant canonical variates, accounting for 31% of the variance in the frequency measures (based on the average of the squared canonical correlations of the two variates). As is evident from variate loadings in Table 30, higher scores for highest SIB frequency are positively associated with more frequent AP (8% of variance), TR (15%), and Routine (7%) antecedents. Children with higher lowest SIB frequencies are reported to more frequently engage in SIB following UN (6%), CB (24%), and ER (11%) behaviors and events.

Results of simultaneous discriminant analysis confirm the relationship between SIB rate group membership and general parameters of SIB; $F(4,68)=8.54$, $p<.001$; rate group=0.006 (low frequency) + 0.002 (high frequency) + 0.339 (number antecedents) + 0.374 (number general topographies) - 2.775. As discussed earlier, specific antecedents and SIB topographies also are related to rate group assignment.

Self-restraint behaviors. Self-restraint behaviors were reported for 9 children (of the 77 for whom present teacher information was available), all of whom were in the 12-22 year age range and all but one of whom were in the high rate group. Seven of the children engaged in no more than one or two self-restraint behaviors (usually attempts to get adults to hold child's hands and/or child holding own hands). These behaviors were an outcome of present or past interventions, such as physical restraint or requiring the self-restraint as an incompatible behavior. However, two children exhibited virtually all self-restraint behaviors on the checklist (see Table 31) on a frequent basis (more than half the time) and had past histories of extensive treatment with material restraints.

Interventions for SIB. Although number of interventions attempted (mean=1.9, S.D.=1.4) was unrelated to SIB frequency (except for past lowest frequency in the 2-6 year age group, $r=0.74$, $p<.01$, $N=10$), more interventions were tried with children with more diversified topographies (number general topographies, $r=0.31$, $p<.01$; number topography subtypes,

Table 30

Canonical Correlation for Antecedents with
Lowest and Highest SIB Frequency

	Canonical Variates			
	1		2	
Antecedents	Weights	R^2	Weights	R^2
ES	-0.2066	.0007	-0.1696	.0098
BR	0.2654	.0309	0.1977	.0423
SP	-0.0866	.0028	-0.1443	.0001
AP	-0.1523	.0283	0.4104	.0798
UN	0.4304	.0562	-0.0895	.0160
PC	-0.2420	.0014	0.3050	.0005
TR	0.1735	.0021	0.6457	.1522
CB	0.6776	.2432	-0.2059	.0010
ER	0.4338	.1134	0.0226	.0010
Routine	-0.0740	.0002	0.0868	.0728
SS/NP	-0.1074	.0177	-0.1041	.0010
No reason	-0.0199	.0013	0.2624	.0250
Other	0.1457	.0246	-0.1926	.0210
Frequency				
Lowest	1.061	.3857	-0.5056	.0033
Highest	-0.127	.0671	1.1684	.4753

Note. Variate 1, $F(26,120)=2.19$, $p < .002$; variate 2, $F(12,61)=1.95$, $p < .05$; R^2=squared multiple correlation and shows the proportion of variance in the criterion set accounted for by each predictor variable (and vice versa).

Table 31

Self-Restraint Behaviors Reported by Teachers

	Child							
Self-Restraint Behavior	1	2	3	4	5	6	7	8
People hold hands			X		X		X	X
Hold own hands	X		X	X	X	X	X	X
Pull sleeve over hand		X				X		
Hands in shirt						X	X	
Hands in material						X	X	
Wind string-like objects						X	X	
Hook fingers in belt						X	X	
Hook hands around objects						X	X	
Hold objects						X	X	
Place objects between fingers						X	X	
Other						X	X	

Note. A ninth child was reported to engage in self-restraint, but behaviors were not specified.

r=0.31, $p < .006$; number topography variations, r=0.34, $p < .003$. As might be expected, teachers who had children for longer time periods also tried a greater number of interventions (r=0.25, $p < .03$). In addition, few teachers reported no intervention in use, and teachers of the youngest age group (2-6 year olds) tried the greatest number of different interventions.

The primary intervention component being used by teachers concurrent with completing the questionnaira was, from most to least frequent: aversive consequence (26), positive consequence (19), restraint (15), ignore (10), train alternative behavior (5), counseling (1), and restructuring environment (0). The specific interventions in use are outlined in Table 32. With younger children, physical restraint and positive consequence (comfort, distract) were more common, and with older children, aversive consequences predominated.

Approximately half of the children were being treated by interventions comprising a single component, and the remaining children were receiving multiple components or multiple interventions. As shown in Table 33, single component interventions resulted in decreased frequency in about two-thirds of the cases. Children showing no improvement or worsening behavior were being treated primarily with unsystematic ignoring procedures, or positive consequences.

Of the 44 multiple component interventions, two-thirds involved incompatible components (27), and one-third involved use of compatible components (17). Effects of compatible components were comparable to those obtained with single component interventions (improvement in 65% of children). However, the opposite results were obtained with incompatible components (decrease in SIB frequency=33%, no change=67%). Incompatible interventions causing lack of improvement, as noted in Table 34, included

Table 32

Number Children by Age Group Treated with Primary Intervention

Intervention	Age Group[a] 2-6 years	7-11 years	12-22 years
Aversive Consequence			
Negative physical	0	2	5
Negative speech	4	1	2
Time out	1	1	2
Attention withdrawal	1	0	7
Restraint			
Material restraint	0	2	1
Physical restraint	8	3	1
Alternative Behavior			
DRO	0	0	2
Functional alternative	0	0	2
Verbal request	0	0	1
Positive Consequence			
Positive physical	2	1	3
Positive speech	1	0	2
Change activity	4	2	1
Vestibular/tactile	1	1	1
Ignore	4	1	5
Counseling	0	0	1

[a] Total number children for 2-6 year=26; 7-11 year=14; and 12-22 year=36.

Table 33

Effects of Single Component Interventions on SIB Frequency

Intervention	Effect Decrease	 No Change	 Increase
Aversive Consequence[a]	10	0	0
Restraint	5	1	0
Alternative Behavior	1	2	0
Positive Consequence	5	5	1
Ignore	2	1	0
Counseling	0	0	0

[a] No effect was reported by teachers for five children with aversive consequences.

Table 34

Effects of Compatible and Incompatible Multiple Component Interventions

	Effect		
Intervention Combination	Decrease	No Change	Increase
Compatible Interventions			
Aversive with			
Aversive	4	3	1
Alternative behavior	4	0	0
Restraint with			
Restraint	0	1	0
Restructure environment	1	0	0
Alternative Behavior with			
Alternative behavior	1	0	0
Ignore	0	1	0
Counseling	1	0	0
Incompatible Interventions			
Aversive with			
Restraint	1	4	0
Positive consequence	4	1	0
Ignore	0	3	0
Counseling	1	0	0
Restraint with			
Positive consequence	1	2	0
Ignore	1	3	0
Alternative Behavior with			
Positive consequence	0	2	0
Positive Consequence with			
Positive consequence	0	3	0
Ignore	1	0	0

aversive consequent combined with restraint or ignore, restraint combined with positive consequences or ignore, positive consequences alternated with ignoring SIB, and combinations of multiple positive consequences.

The extent to which children were viewed as able to control their SIB was significantly related to the effectiveness of the intervention in use (phi coefficient=-0.31, $\underline{p} < .003$, where SIB decrease=1, can never control SIB=1). In contrast, perceived degree of self-control was unrelated to any of the SIB parameters.

Onset of SIB. Despite the presence of younger children in this study sample, only three out of 77 children were reported to have begun exhibiting SIB after enrollment in the present teacher's classroom. Of these, one child commenced head banging prior to enrollment at approximately 9 months of age, but did not exhibit the behavior at school until over a year later. According to parent questionnaire, the head banging initially appeared to be self-stimulatory and occurred only in the crib. Over the next year and a half two new topographies of face hitting and hair pulling were also acquired.

The remaining two children's SIB was noted by teachers concurrent with the onset of physical distress at 2 and 3 years of age respectively. The first of these children began hitting fist to forehead while a frontal cyst was filling with fluid. However, within two weeks of the onset of the SIB other functions were observed, including attention (when left alone) and avoidance (during disliked activities). The other child initially exhibited hand biting when refused additional food at snack and head hitting with both fists during urination (simultaneous with a urinary tract infection). However, whether SIB had previously been observed at home and under different conditions is not known.

Finally, two parents of older children (8 and 16 years respectively) report onset at later ages. The 8 year old began hand biting at 5 years of age when frustrated or denied something she wanted, but discontinued the behavior within a year. Fist to skull hitting, which emerged concurrently and continues to be present, was thought by parents to be another self-stimulatory behavior.

The 16 year old is recollected to have engaged in head banging at 5 years of age first in school and subsequently at home. The acquisition of new SIB topographies as well as self-restraint behaviors appear to be outgrowths of interventions used at school (as reported by parent). Additionally, the SIB frequency over time corresponds to the pattern of increasing means obtained for high rate children in successive age groups (range at home at 2-6 years of age=less than once a week to 4 incidents per day, 7-11 years=2 incidents per day to 4 SIB per hour, 12-22 years= 9-99 SIB per hour).

Although limited to only five children, the above information supports at least three hypotheses of SIB onset forwarded to date, i.e., onset as rhythmic behavior arising at about 9 months of age in the normal population, as pain-related, and in response to frustration. In addition, the rapidity with which SIB came under environmental control for onset associated with pain is instructive.

Perceived function of SIB. Since most teachers were not present at the onset of SIB, only their hypotheses regarding maintenance of SIB were analyzed. Content analysis of teachers' responses revealed six general categories (see Table 35 for responses subsumed under categories). The most frequently forwarded explanation (for 42% of children) related to the function of SIB; i.e., as expression of frustration, for attention, as a means of avoidance, and when prevented from "getting own way" (or to get own way). The second most frequently chosen category related to physiological phenomenon (23% of children), including SIB as pain related, medication related, when tired or hungry, as bite reflex, for needed stimulation, or as reflecting tactile defensiveness. Behavioral contingencies maintaining SIB, also listed for 23% of children, primarily posited reinforcement of SIB in settings other than the classroom, e.g., at home, on bus, in ancillary activities. Included were attention provided, disliked activities terminated, or obtains own way contingent on SIB, as well as inconsistent treatment of SIB, and alternative communication not reinforced in all settings. A fourth category focused on SIB as a manifestation of communication deficits (19% of children). The least frequently forwarded hypothesis involved psychological explanations (6% of children) and included poor self-esteem, self-punishment, feeling unwanted, and response to parental criticism or physical abuse. Miscellaneous other explanations (for 18% of children) comprised SIB as habit, self-stimulatory behavior (as opposed to SIB), imitation of peers, reaction to program setting or noise level, and for no apparent reason.

Overall, these responses dealt with events which might precipitate SIB or "explain" the behavior. However, teachers seldom cited the events in their own settings which might be reinforcing and thus maintaining the SIB.

Table 35

Teachers' Explanations of Why Children
Continue to Exhibit SIB

Explanation	N
Function of SIB	
Frustration	11
Attention	9
Avoidance	9
Get own way	3
Physiological	
Stimulation	5
Pain related	7
Medication related	2
Bite reflex	2
Tired/hungry	2
Reinforcement	
Inconsistent treatment	4
Attention provided	6
Disliked activities terminated	5
Obtains own way	3
Communication not reinforced	2
Communication	
No effective communication	13
For communication	3
Psychological	
Poor self-esteem	1
Self-punishment	1
Feeling unwanted	1
Parental criticism	1
Physical abuse	1
Upset with home	1
Miscellaneous	
Self-stimulatory	4
Habit	3
Tune out others	1
In own world	1
Reaction to program	1
Left alone	1
Noise, activity level	1
Imitation of peers	1
No reason	1
Don't know	1

Antecedent/Consequent Card Sort

The Antecedent/Consequent Card Sort was completed by present teachers for 79 children, including 26 2-6 year olds, 14 7-11 year olds, and 39 12-22 year olds; by past teacher for 7 children (one 2-6 year old, six 12-22 year olds); by a second past teacher for two 12-22 year olds; and by parents for three children (one in each age group). Of the total group, 48 children were assigned to the high rate group (11 2-6 year olds, 10 7-11 year olds, and 27 12-22 year olds) and 27 were low rate SIBers (13 2-6 year olds, 4 7-11 year olds, and 10 12-22 year olds). In addition, 77 of the total 79 children received the SIB Teacher Perception Questionnaire, while the remaining two children were 12-22 year old, high rate SIBers who received Parts II and III of the study. Mean ages of children correspond to those reported for the questionnaire and are listed in Table 36.

Analysis of the card sort comprised three steps: 1) item reduction to derive a shorter form for professionaluse; 2) identification of dimensions underlying the items; and 3) interpretation of profiles of SIBers based on dimensions identified in Step 2. Disjoint cluster analysis (Varclus, SAS, 1981), an iterative orthoblique procedure,was utilized to derive "meta-items" in Step 1 and to identify the dimensions underlying

Table 36

Mean Ages of SIBers on Antecedent/Consequent Card Sort

by Age Group

Informant and Rate Group	Age Group								
	(N)	2-6 years		(N)	7-11 years		(N)	12-22 years	
		Mean	S.D.		Mean	S.D.		Mean	S.D.
Present teacher	(26)	52.6	(18.1)	(14)	113.1	(18.9)	(39)	207.0	(37.3)
High rate	(11)	56.1	(18.1)	(10)	111.7	(16.9)	(27)	202.9	(34.4)
Low rate	(13)	48.5	(16.8)	(4)	116.5	(26.0)	(10)	213.2	(44.5)
First past teacher	(1)	42.0	(0.0)	(0)	-	-	(6)	184.2	(44.5)
Second past teacher	(0)	-	-	(0)	-	-	(2)	197.0	(2.8)
Parent	(1)	30.0	(0.0)	(1)	94.0	(0.0)	(1)	203.0	(0.0)

these meta items in Step 2.[1] Clusters obtained by this procedure contain non-overlapping sets of variables, and each cluster is considered to reflect a single, underlying dimension. The Varclus procedure begins with all variables in a single cluster and repeats the following steps until the optimal number and composition of clusters have been identified:

> A cluster is chosen that has either the smallest percentage of variation explained by the first principal component or the largest amount of variation explained by the second component. The chosen component is split into two clusters by finding the first two principal components, performing an orthoblique rotation, and assigning each variable to the rotated component with which it has the higher squared correlation. Variables are then iteratively reassigned to

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[1] Due to the large number of variables relative to subjects, R-technique factor analysis could not be used. Q-technique factor analysis, involving grouping of subjects rather than variables, was deemed inappropriate as few subjects were thought to have pure profiles (i.e., exhibit only one function of SIB). Although Chronbach's alpha could have been applied to items within each a priori category, cluster analysis was chosen as an empirical means of grouping items. An initial attempt to use alpha factor analysis (Kaiser & Caffrey, 1965) for Step 2 resulted in most items loading on Factor 1, with remaining factors reflecting a few variables idiosyncratic to small subgroups of SIBers (e.g., self-restrainers, children treated with material restraints, etc.). This was due to factor alpha's procedure of giving more weight to items with lower commonalities (problem cited in Cattell, 1978).

clusters to maximize the sum of the largest eigenvalues in each cluster. The clustering procedure stops when each cluster has only a single eigenvalue greater than one (Young & Sarle, 1981, p. II-93).

Reduction of card sort items. All general categories and their constituent items were assigned to one of five sets (47 to 67 items per set) as follows:

Set 1. Environmental stimuli not directed to child - including auditory environmental stimuli, visual environmental stimuli, tactile/kinesthetic environmental stimuli, adult-peer interaction, adult approach to child, and adult leave child items;

Set 2. Adult physical contact, task presentation, and communication behavior - including adult physical contact, visual task presentation, tactile/kinesthetic task presentation, auditory task presentation, adult physical prompt, adult referential gesture, adult negative action on object (take unoffered object from child), and adult positive verbal and sign items;

Set 3. Child task and nontask behavior - including correct, approximation, error, discrete behavior, watch, work, play, unoccupied, no response, self-stimulatory behavior, and transition items;

Set 4. Consequences serving as antecedents - including adult administer positive reinforcement, adult terminate reinforcement, adult ignore child, adult initiated restraint, child initiated restraint, adult terminated restraint, child terminated restraint, adult watch, adult no response, adult stop self-stimulatory behavior, adult negative physical contact, and adult negative speech items; and

Set 5. Child communication and negative behavior - including simple and complex nonverbal communication directed to person or object, transitional nonverbal communication, coordination of person and object, referential gesture, negative motor-gestural, negative action on object, negative physical contact, negative vocalization, symbolic speech, sign, and negative speech items.

Each of the above sets of items was cluster analyzed separately, yielding from 9 to 14 clusters per set or a total of 55 clusters. These clusters and the overall sets from which they were derived are listed in Table 37. The final clustering solutions accounted for an average of 65% of the variance within each set of items (set 1=66%; set 2=68%; set 3=66%; set 4=63%; and set 5=62%).

In general, clusters corresponded to the original card sort categories which, in turn, were based on the observational coding system. This correspondence took one of three forms: the general category remained intact with all items comprising a single cluster; the general category was split into two or more clusters comprising subgroups of items; or general categories with one or few items each were combined to form a cluster. The few items with low correlations with their clusters were deleted.

The 55 clusters were considered the new "meta-items" for the revised card sort. The new items were rewritten to encompass the original items

Table 37

First-Order Cluster Analysis of Antecedent/Consequent Card Sort Items

	Item Sets				
Clusters	Environmental Stimuli	Adult Physical Contact, Task Presentation, Communication	Child Task and Non-Task Behavior	Consequences Serving as Antecedents	Child Communication and Negative Behavior
1	AP Adult Approach AP 1-7	VTP Visual Task Presentation, present VT 1-10	WA Walk (transitional behavior) WA 1-8	RAP Adult Restraint, Physical RA1, RA10, TA1, TS1	CHCA Child Coordinated Communication CP, CHCA 1-3
2	AEL Loud Sounds AE1,2,5,6,9	TT Tactile/Kinesthetic Task Presentation PC 17, TT 1-4, GENTT2, TTK1, TT7, TTK2	CC Task Performance, comply correct CC1, 3-8	RSO Self-Restraint with objects RS 5-7, RS9, TA 4-5, TS 6	NAO Child Negative action on objects NG6, NA 3-5
3	VEF Visual Environmental Stimuli; food related VE 7,8,9	VTR Visual Task Presentation, remove VT 11-13, ADNA	UN/SS Unoccupied and Self-Stimulatory Behavior UN 1-4, SS	PR Positive Reinforcement, administer PR 1-6	CHSN Child sign to comment, question CHSYM 5,6
4	VEP Visual environmental stimuli, adult leave or enter room VE 3-6	PC/CA Physical contact, adult prompt task PC 1-3, 5-8; ADCA 3-5	AX/ER Task performance, approximation and error AX 1, 3-4; ER 1, 3-4 WT 2	RSC Self-restraint with clothes RS3, TS5	NP child negative physical contact NG7, NP 1,2,6,7
5	AES Sudden sounds AE 3-4, 10	ADCR/BR Adult nonverbal and verbal behavior requests ADCA1; ADCR 1-3; ADSYM1, ADBR, ADBR1	WT Child Watch WT 1, 3-7	RAM Adult Restraint, material RA 3,5,6; TS 2,4,9	NGA Child Negative motor/gestural, avoid/reject NG1, NG4, NP 3-4

Table 37 (continued)

	Item Sets				
Clusters	Environmental Stimuli	Adult Physical Contact, Task Presentation, Communication	Child Task and Non-Task Behavior	Consequences Serving as Antecedents	Child Communication and Negative Behavior
6	AEM Musical sounds AE 6-7, 11-12	PCG Physical contact, general PC 9-16, 21	TPSN Task Performance, sign CC2, AX2, ER2	IG Adult ignores IG 1-3	CHNSP Child negative speech CHNSYM, CHNI
7	AL Adult leave AL 1-4	AD SP/SN Adult comment, question, sign ADIS, ADIR, ADBRSN, ADISSN, ADIRSN	TE/CB Tactile/kinesthetic stimuli, child behavior TE 1,2	RAT Adult Restraint, ties RA 7,9	CHNSP Child speech CHSYM 1-3
8	VED Doors open, close VE 1,2	AT Auditory task presentation AT 1-4	CB Child behavior CB 1-6	PRNA Positive reinforcement, terminated PR/NA 7-9	NART Child negative action on object, resist take NA 6,7 NP5
9	VEO Visual environmental stimuli, liked and disliked objects VE 10-13	PCC Physical contact, caretaking PC 4, 18-20		RAH Adult restraint, helmet RA2; TA 2,3; TS3	NV Negative vocalization NV 1-3
10	TEU Tactile/kinesthetic environmental stimuli, unexpected contact TE 5-7	TTV Tactile/kinesthetic task presentation, vibrator TT 5-6		ADNSP Adult negative speech ADNSYM, ADNB, ADNI	Deleted
11	PI Adult-peer interaction PI 1-3, 5-7			ADNP Adult negative physical contact ADNP 1-3	CH S/C Child simple communication SC,SO,CA,CO,TR, CHCR 4

Table 37 (continued)

	Item Sets				
Clusters	Environmental Stimuli	Adult Physical Contact, Task Presentation, Communication	Child Task and Non-Task Behavior	Consequences Serving as Antecedents	Child Communication and Negative Behavior
12				RSOTH Self-restraint, other RS4, TS8	CHCA/BR Child nonverbal behavior requests (higher level) CHCA 5-7; CHCR 2; CHSYM 4
13				ADNR Adult no response WT8, NR 3,4,7	
14				RAS Adult restraint, splints RA4, RS1	
15				SSNP Adult terminate self-stimulatory behavior (taken from Cluster). SSNP	

as instances of the "meta-item" (see revised Antecedent/Consequent Card Sort, Appendix I).

Subjects' scores on each meta-item were derived by summing scores of items within a cluster and dividing by the number of items. This procedure enabled the meta-items to retain the original scoring range (0-4) and eliminated inequality due to differing numbers of items within clusters.[1]

Identification of card sort dimensions. The 55 meta-items were cluster analyzed to identify the underlying dimensions of the card sort. Eleven second-order clusters were generated which accounted for 60% of the variance in the meta-items. These clusters may be viewed as major classes of antecedent/consequents to SIB and are listed in Table 38.

The first cluster (#1), termed "Presentation of and Reaction to Mands," appears to reflect avoidance and comprises implicit and explicit mands and related responses. Meta-items included are AP adult approach; VTP visual task presentation; ADCR/BR adult verbal and gestural behavior requests; ADNR adult watches child or does not respond to child communication, independent activity, or negative behavior; AX/ER child approximate

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[1] Two alternative procedures were considered and rejected. The first method involves retaining the item with the highest correlation with a cluster. This was considered inappropriate as the intent of clustering was to group items rather than to choose representative items. The second method uses scoring weights generated by the Varclus procedure. When these are used, clusters no longer correspond to the 0-4 scale, and clusters have unequal upper scoring limits.

Table 38

Second-Order Cluster Analysis of Meta-Items of Antecedent/Consequent Card Sort

Cluster 1		Cluster 2		Cluster 3		Cluster 4		Cluster 5		Cluster 6	
Item	R^2	Item	R^2	Item	R^2	Item	R^2	Item	R^2	Item	R^2
AP	0.65	TT/V	0.78	ADNSP	0.56	VEP	0.40	VEF	0.43	UN/SS	0.56
VTP	0.70	RAM	0.86	NAO	0.63	AL	0.57	TEU	0.54	RAP	0.59
ADCR/BR	0.85	CH/SN	0.51	NP	0.52	VED	0.36	TT	0.77	ADNP	0.49
WA	0.59			CHNSP	0.25	VEO	0.54	PC/CA	0.72	SS/NP	0.62
AX/ER	0.69			CHSP	0.43	PI	0.47	PCG	0.61		
WT	0.72			NART	0.44	VTR	0.28	PCC	0.69		
ADNR	0.67					IG	0.41	TE/CB	0.42		
NGA	0.74					PRNA	0.65				
CB	0.66					NV	0.32				
						CHS/C	0.69				

Cluster 7		Cluster 8		Cluster 9		Cluster 10		Cluster 11	
Item	R^2	Item	R^2	Item	R^2	Item	R^2	Item	R^2
AEM	0.73	AEL	0.73	RAT	0.83	RSO	0.62	ADSP/SN	0.65
AT	0.70	AES	0.73	RAS	0.83	RSC	0.50	CC	0.49
RAH	0.55					RSOTH	0.51	TPSN	0.58
								PR	0.63
								CHCA	0.75
								CHCA/BR	0.72

Note. Clusters were identified through disjoint cluster analysis (Varclus, SAS, 1981).

or error responses; CB discrete intentional or accidental behaviors by child; WT child watches persons, materials, or activities; WA child leaves an activity that has just ended or is going to the next activity; and NGA child attempts to avoid or push away adult or adult presented objects.

A second cluster (#5), termed "Physical Contact and Tactile/Kinesthetic Stimuli," also is primarily avoidant and comprises: PC/CA physical prompts to interact with materials; PCC physical contact involving caretaking behavior; PCG general physical contact; TT tactile/kinesthetic task presentation; and TEU and TE/CB unexpected tactile or kinesthetic stimuli caused by other persons or the child. The meta-item VEF (observing food being prepared, out of reach or unavailable, or being put away) also loads on this cluster, although less so than other items.

The third cluster (#4), "Visual Stimuli and Related Reactions," constitutes visual environmental stimuli, removal of persons or objects, and simple communicative behaviors which might be directed to desired persons or objects. This cluster largely appears to reflect antecedents to SIB that might be maintained by positive reinforcement (enstating or reinstating desired objects, events, or attention). Specific meta-items subsumed in the cluster are: AL adult moves in direction away from child; VEP adult enters or leaves the room; IG adult ignores child; PI adult interacts with peers; VTR adult removes task materials; PRNA adult terminates (removes) positive reinforcers; VEO child observes liked or disliked objects; VED doors open or close in front of child; NV child negative vocalization; CHS/C child simple communication (simple and complex behaviors directed to a person or object).

The fourth cluster (#11), "Appropriate Behavior," reflects appropriate communication and compliance by the child as well as positive speech and presentation of positive reinforcers by the adult. This class indicates that the child has learned to engage in appropriate behavior, but that the behavior is paired with engaging in SIB. Meta-items include: TPSN child correct, approximate, or error signs; CHCA child gives object to or takes object from adult; CHCA/BR child nonverbal behavior request (signalling by prompting or leading adult); CC correct task performance; PR adult administers positive reinforcer; ADSP/SN adult comment, question, or sign.

The fifth cluster (#3) has been termed "Avoidance Escalation" and appears to correspond to what Patterson (1979) has described as escalation in coercive behaviors. Such escalation involves successive attempts to terminate aversive stimuli. Meta-items reflect more severe negative/ manipulative behavior than that noted in the first avoidance cluster (mands) or the first positive reinforcement cluster (visual stimuli) and include: NAO negative actions on objects; NART negative attempts to obtain objects or prevent adult from removing objects; CHNSP negative speech by child; ADNSP negative speech by adult; and CHSP positive speech by child.

Sixth (#6) is "Self-Stimulatory Behavior and Adult Negative Consequences." Component meta-items are UN/SS child unoccupied or self-stimulatory behavior; RAP adult administration or termination of physical restraint; ADNP adult negative physical contact; and SS/NP adult attempts to terminate self-stimulatory behavior.

Initiation and termination of self-restraint with objects (RSO), clothing (RSC), or other objects (RSOTH) comprise a seventh cluster (#10) of "Self-Restraint." Application and termination of material restraints (RAT ties and RAS arm splints) are infrequent within the study sample and form a separate, eighth cluster (#9), "Material Restraints." Ninth (#8) is "Unexpected or Loud Sounds," composed of AES unexpected sounds and AEL loud sounds (both environmental stimuli not directed to the child). The tenth cluster (#7), "Musical Sounds," comprises AEM auditory environmental stimuli involving music, and AT auditory task presentation. RAH adult restraint with helmet also is included, but has a lower squared correlation with the cluster. And the last cluster (#2), "Miscellaneous," appears to be specific to individuals with whom vibrators and miscellaneous material restraints are used (application and cessation of TTV vibrator and of RAM material restraints of cloth, mittens, string, etc.) and who, to a lesser extent, sign to comment or question (CHSN, r^2=0.51).

The intercorrelation matrix of second-order clusters, reproduced in Table 39, exhibits a pattern similar to that originally obtained with alpha factor analysis; i.e., major clusters highly intercorrelated, and clusters reflecting a few individuals less or uncorrelated with the major clusters and each other. As a result of this pattern, no further attempt to reduce clusters was undertaken (e.g., principal component factor analysis).[1]

Profiles of SIBers. In order to be consistent with treatment of first-order cluster analysis, the eleven dimensions were also scored by summing meta-items within second-order clusters and dividing by the number of items in the cluster. The obtained scores were utilized to identify the relative frequency with which each antecedent/consequent class was reported to precede and/or follow SIB.

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[1] Although cluster and factor analyses treat variables differently, the presence of outliers mentioned above was likely to result in a separation of persons rather than variables with factor analysis (Rummel, 1970).

Table 39

Intercorrelations of Second-Order Factors of Antecedent/Consequent Card Sort

	Clusters										
	1	2	3	4	5	6	7	8	9	10	11
1	1.00	0.39	0.58	0.74	0.76	0.50	0.58	0.25	0.12	0.19	0.78
2		1.00	0.35	0.42	0.39	0.21	0.41	0.45	0.30	0.15	0.39
3			1.00	0.55	0.47	0.53	0.29	0.29	0.02	-0.04	0.58
4				1.00	0.70	0.50	0.49	0.17	0.10	0.21	0.73
5					1.00	0.54	0.56	0.21	0.00	0.13	0.64
6						1.00	0.26	0.16	0.04	-0.10	0.32
7							1.00	0.44	0.13	0.15	0.48
8								1.00	0.01	0.03	0.26
9									1.00	0.13	0.12
10										1.00	0.20
11											1.00

Note. Cluster 1=Presentation of and Reaction to Mands; Cluster 2=Miscellaneous; Cluster 3=Avoidance Escalation; Cluster 4=Visual Stimuli and Related Reactions; Cluster 5=Physical Contact and Tactile/Kinesthetic Stimuli; Cluster 6=Self-Stimulatory Behavior and Adult Negative Consequences; Cluster 7=Musical Sounds; Cluster 8=Unexpected and Loud Sounds; Cluster 9=Restraint with Ties; Cluster 10=Self-Restraint; and Cluster 11=Appropriate Behavior.

The basic profile generated for all SIBers combined, from most to least frequent clusters, is: Cluster 6 Self-Stimulatory Behavior and Negative Consequences (mean score=1.61, S.D.=1.04); Cluster 1 Presentation of and Reaction to Mands (mean=1.18, S.D.=0.95); Cluster 5 Physical Contact and Tactile/Kinesthetic Stimuli (mean=1.11, S.D.=0.87); Cluster 4 Visual Stimuli and Related Reactions (mean=0.93, S.D.=0.71); Cluster 11 Appropriate Behavior (mean=0.98, S.D.=0.76), Cluster 3 Avoidance Escalation (mean=0.73, S.D.=0.66); Cluster 8 Unexpected and Loud Sounds (mean=0.54, S.D.=0.71); Cluster 7 Musical Sounds (and helmet, mean=0.41, S.D.=0.64); Cluster 2 Miscellaneous (vibrator, material restraint, and child sign; mean=0.18, S.D.=0.52); Cluster 9 Material Restraints (ties and splints, mean=0.15, S.D.=0.52); and Cluster 10 Self-Restraint (mean=0.06, S.D.=0.22). Figure 5 depicts these clusters in relation to the mean and standard deviation of the profile as a whole.

Interestingly, all three age groups are characterized by this same pattern. As is evident in Figure 6, the groups differ only in terms of relative scores, with the older groups generally receiving higher scores than the youngest group. Specifically, Clusters 1 Mands (partial F [2,68]=5.41, $p < .01$) and 6 Self-Stimulatory Behavior and Negative Consequences (partial F [2,68]=3.77, $p < .05$) are higher for the two oldest as compared to the youngest group, while Cluster 4 Visual Stimuli (partial F [2,68]=6.59, $p < .01$) is perceived as lower in the two youngest groups; stepwise discriminant equation (F [4,138]=5.95, $p < .001$): Age group=-1.5650 (Mands) +0.89178 (Visual Stimuli) + 0.9716.

As with the age groups, the high and low rate groups share the prototypic profile with the low rate group exhibiting lower scores on all clusters (see Figure 7). However, only Cluster 5 Physical Contact and

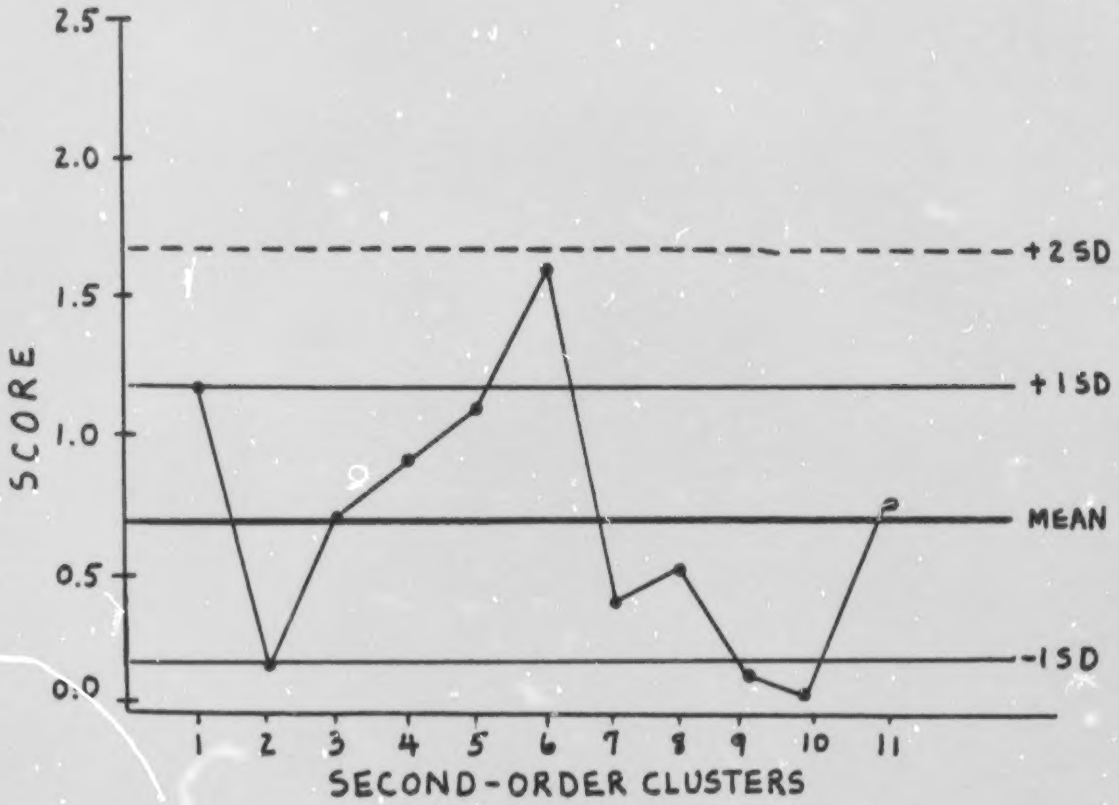


Figure 5. Antecedent/Consequent Card Sort Profile for All SIBers Combined.

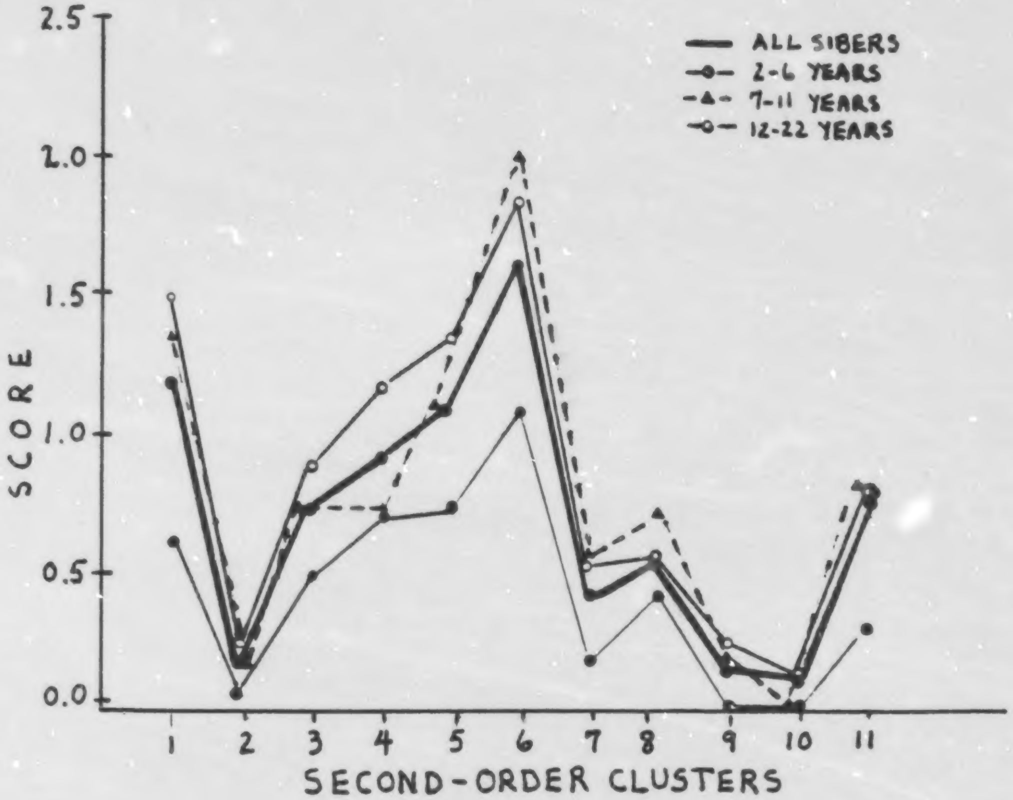


Figure 6. Antecedent/Consequent Card Sort Profiles by Age Group.

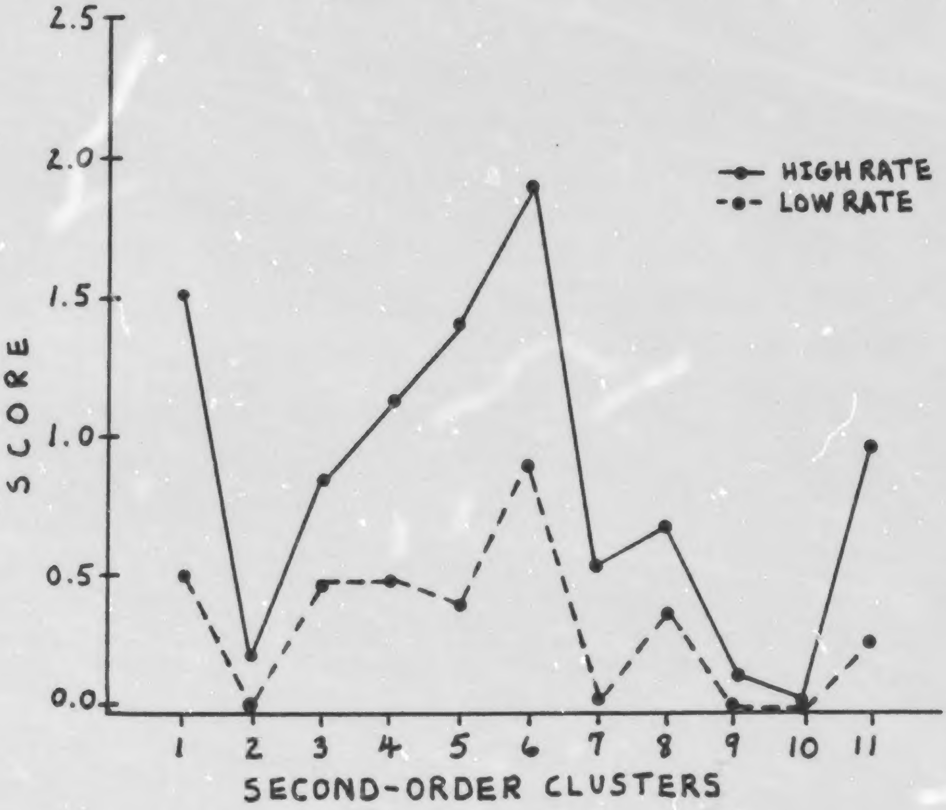


Figure 7. Antecedent/Consequent Card Sort Profile by Rate Group.

Tactile/Kinesthetic Stimuli (partial F [1,68]=16.947, $p < .01$) and Cluster 6 Negative Consequences (partial F [1,68]=4.047, $p < .05$) significantly discriminate between the groups. Utilizing the discriminant equation for these variables (F[2,68]-21.28, $p < .001$), it is possible to correctly assign 83% of children to the high and low rate groups; rate group=1.1216 (Cluster 5)+0.4566(Cluster 6)-1.8779.

When rate groups are further subdivided by age group, the differences reported earlier for age groups are obtained only for the low rate group; i.e., higher scores for 7-11 and 12-22 year olds on Clusters 1 and 6 and lower scores for 2-6 and 7-11 year olds on Cluster 4. The 12-22 year olds also show higher scores on Clusters 8 (Unexpected and Loud Sounds) and 11 (Appropriate Behavior). In contrast, the age groups within the high rate group received virtually identical scores on each cluster (see Figure 8).

Individual Profiles. Although a prototypic profile of antecedents to SIB has been identified, it does not follow that all SIBers exhibit this same profile. As can be seen in Figure 9, teachers of children observed in Part IV of the study (highest rate SIBers) reported distinctly different profiles for these children. For example, the profile of child 11-4, a totally blind child, shows SIB in relation to physical and tactile stimuli, self-stimulatory behavior and negative consequences, and unexpected or loud sounds. In contrast, child 10-5 engages in SIB most frequently following verbal and nonverbal mands, visual stimuli (not directed to him), and appropriate behavior.

Comparison of card sorts completed by past and present teachers indicates that certain children's profiles are perceived as similar over time (2 children), while others' profiles are reported to have changed

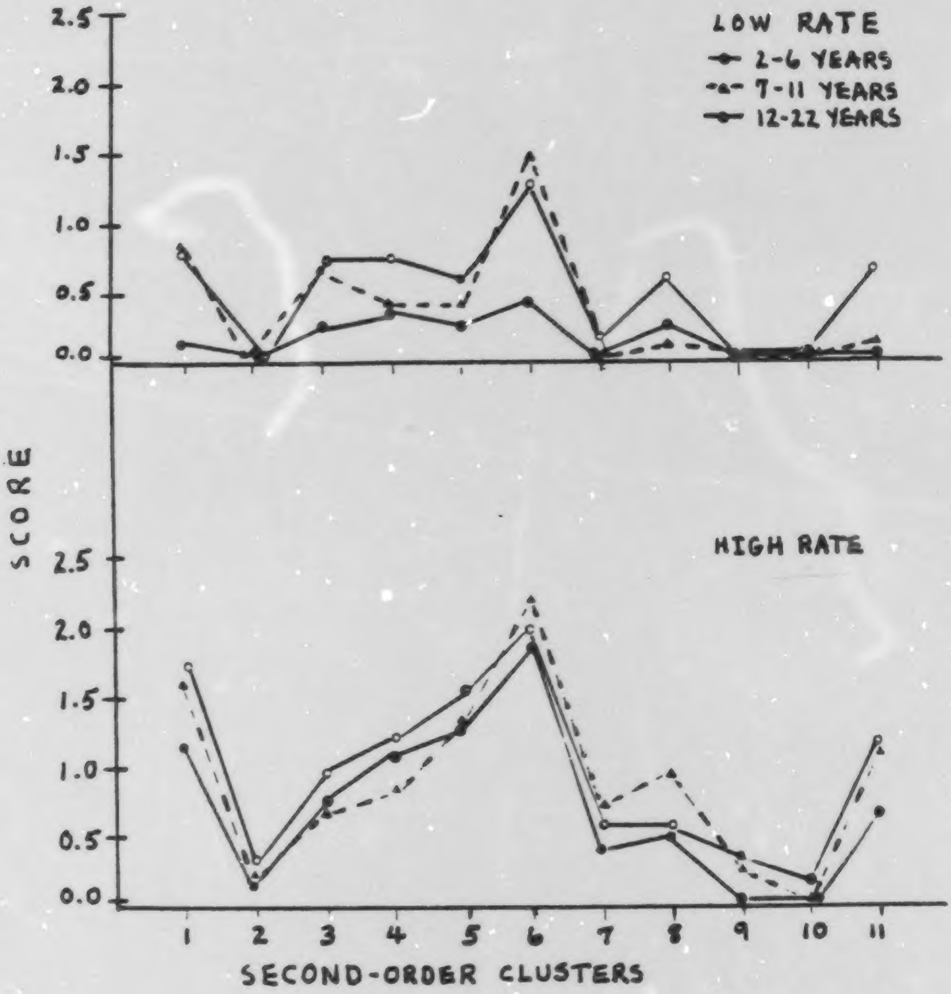
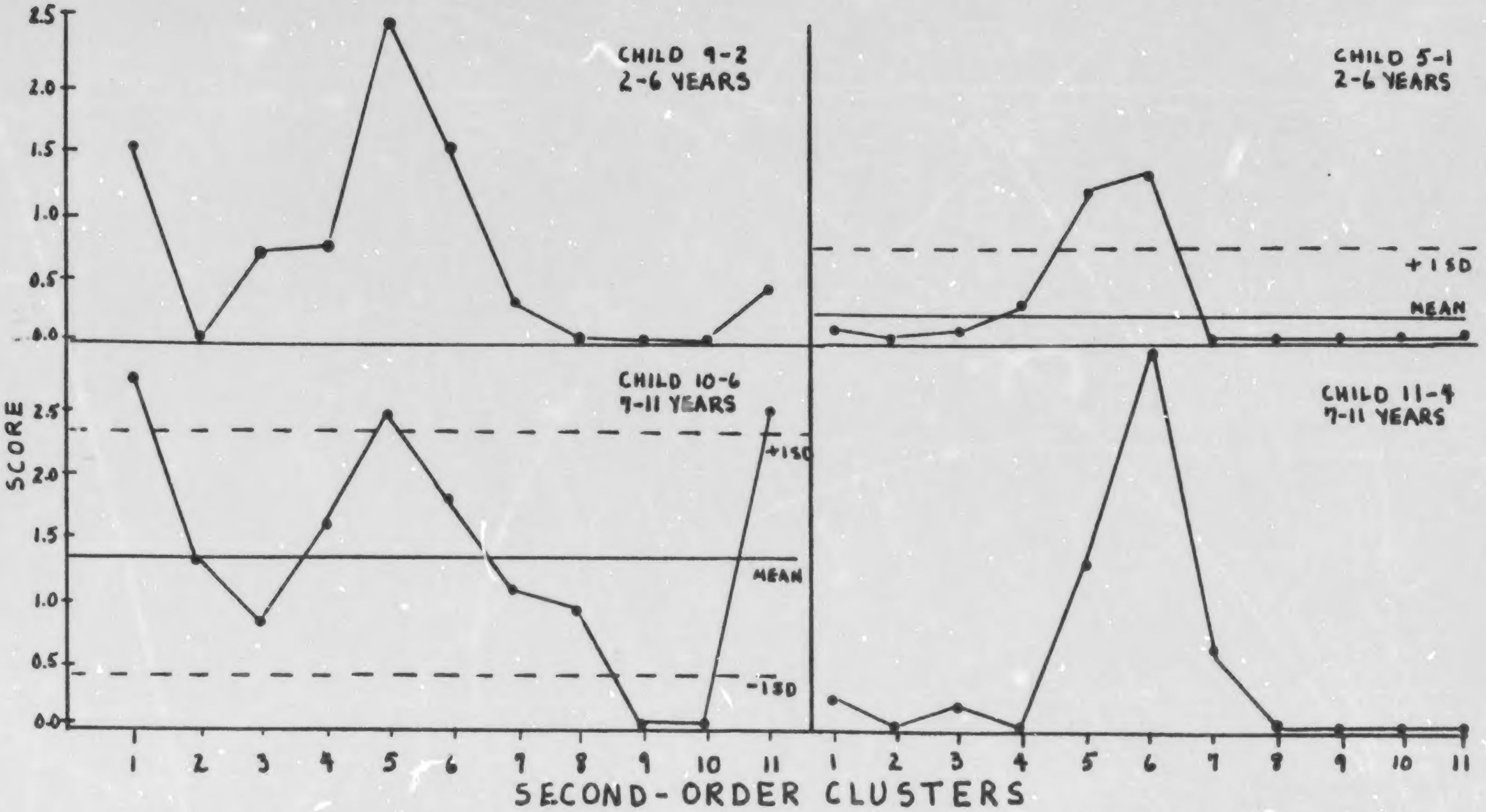


Figure 8. High and Low Rate Group Profiles by Age Group.



169 Figure 9. Antecedent/Consequent Card Sort Profiles of Children Receiving Naturalistic Observations.

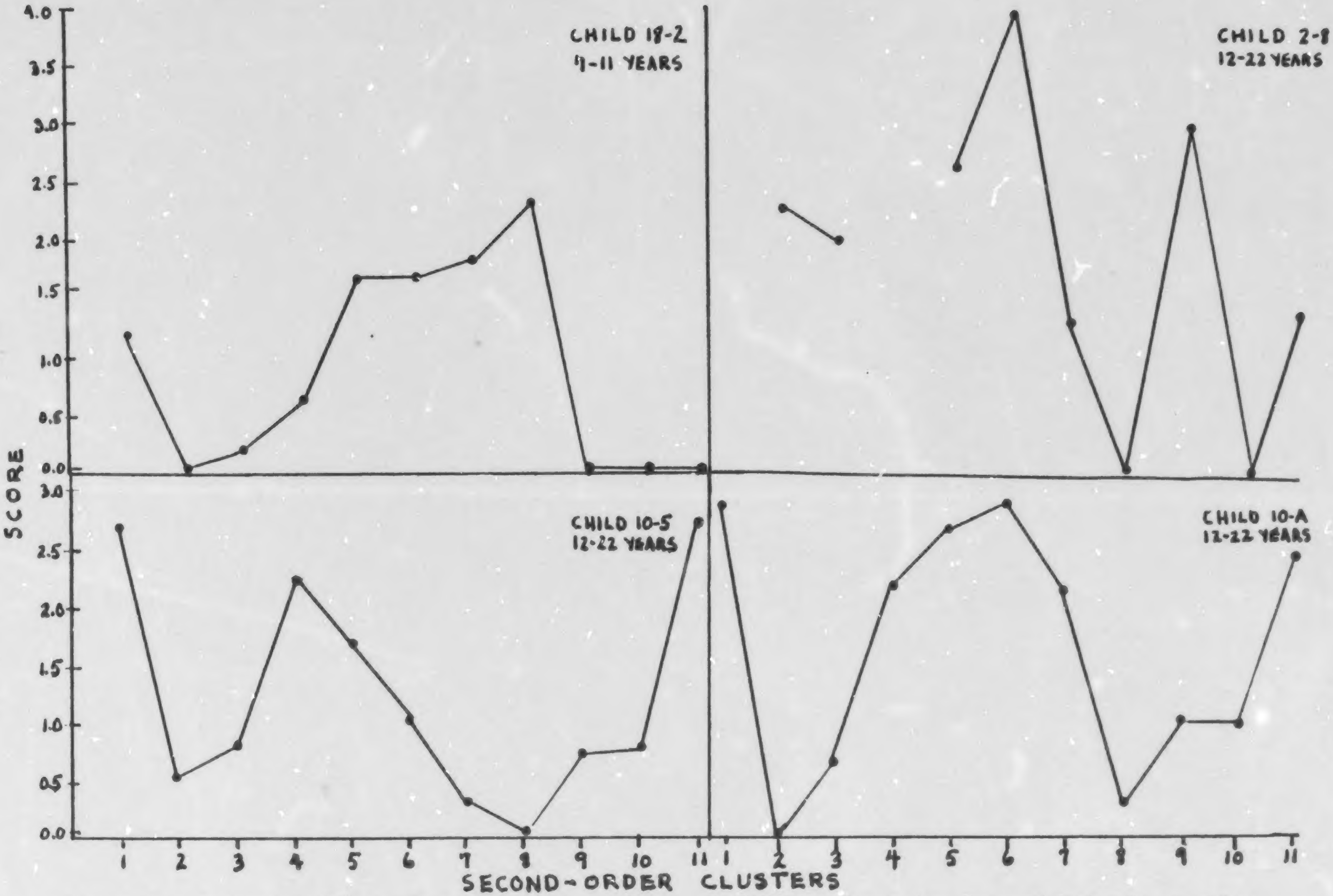


Figure 9. Antecedent/Consequent Card Sort Profiles of Children Receiving Naturalistic Observations (continued).

(2 children acquired new clusters, 2 children ceased SIB relative to certain clusters). For example, the child in the 2-6 year old group was reported to engage in SIB relative to several classes of antecedents by the present teacher and in reaction to only one class by the past teacher. This change paralleled acquisition of new SIB topographies and increased frequency of SIB.

In addition, present teacher and parent profiles were similar for the 7-11 and 12-22 year olds, but not for the 2-6 year old receiving both card sorts. For the youngest child, SIB occurred in more diverse situations in the home than at school.

Interrelationship of SIB Teacher Questionnaire and Antecedent/ Consequent Card Sort. Both lowest and highest frequency of SIB per hour, reported on the questionnaire, correspond to cluster scores on the card sort. Lowest frequency of SIB is significantly related to Clusters 6 (Negative Consequences - 10% of variance), 7 (Music and helmet restraint - 9%), 10 (Self-Restraint - 20%), and 11 (Appropriate Behavior - 7%), and is predicted by the following equation; ($F[11,59]=3.64$, $p < .006$): Lowest frequency = -2.57(Cluster 1)-2.62(Cluster 2)-1.02(Cluster 3)-4.55(Cluster 4)+0.49(Cluster 5)+4.68(Cluster 6)+7.61(Cluster 7)-3.75(Cluster 8)+1.50 (Cluster 9)+26.26(Cluster 10)+6.57(Cluster 11). Similarly, scores on Cluster 10 Self-Restraint and Cluster 11 Appropriate Behavior significantly account for 29% and 7% of the variance in the highest frequency measure (F [11,59]=5.92, $p < .0001$); multiple regression equation: Highest frequency=41.48(Cluster 1)-25.12(Cluster 2)-15.82(Cluster 3)-36.63(Cluster 4)+32.63(Cluster 5)-4.01(Cluster 6)-44.59(Cluster 7)-26.60(Cluster 8)+ 59.11(Cluster 9)+284.94(Cluster 10)+59.27(Cluster 11).

To determine consistency in responding, teachers' scoring of the 13 general antecedents (questionnaires) was compared to scoring of the card sort clusters. In general, moderate and significant correlations were obtained with corresponding antecedents for Clusters 1 Mands (with behavior requests, adult approach, transitions, changes in routine), 3 Avoidance Escalation (with adult attempt to stop inappropriate behavior), 5 Physical and Tactile Contact (with physical contact), 6 Negative Consequence (with adult attempt to stop inappropriate behavior), and 8 Unexpected and Loud Sounds (with unexpected sounds and movements); $r=0.24-0.61$, $p<.04-.0001$. Among clusters without direct correspondence to questionnaire antecedents, Cluster 2 Miscellaneous was related to unexpected sounds and movements ($r=0.27$, $p<.02$), Cluster 4 Visual Stimuli to change in routine ($r=0.39$, $p<.0006$), Clusters 7 and 9 Musical Sounds and Helmet or Material Restraints to "no reason" ($r=0.77$, $p<.03$ and 0.31, $p<.005$), and Cluster 11 Appropriate Behavior with a variety of command related antecedents.

A.A.M.D. Adaptive Behavior Scale

The Adaptive Behavior Scale (ABS) was completed by school personnel (84% by teacher and 16% by other familiar person) for 76 children. These included 25 2-6 year olds (mean age=53.0 months, S.D.=17.4), 14 7-11 year olds (mean age=115.9 months, S.D.=19.7), and 37 12-22 year olds (mean age=205.4 months, S.D.=37.0).

Adaptive Behavior. As evident in Table 40, Part I Adaptive Behavior domain raw scores increase with successive age group levels. However, multiple regression analyses of actual chronological age (CA) in months with 8 Part I domains ($F[8,63] = 2.64$, $p < .01$) indicates that only language development is significantly related to CA ($F[1,63] = 7.91$, $p < .006$), with lower language development (LD) associated with higher CA (equation weight= -2.81). The complete multiple regression equation also shows that scores for economic activity (EA), domestic activity (DA), numbers and time (NT), and to a greater extent independent functioning (IF) account for most of the relationship with CA, whereas socialization scores are negatively related to CA (decrease with increasing age): $CA = 1.10(IF) + 7.48(EA) - 6.30(LD) + 4.12(NT) + 5.53(DA) + 0.87(SD) + 0.72(Resp) - 1.32(Soc)$.

Despite apparent increases in raw scores on various domains, actual standing relative to institutional norms and reflected by domain deciles decreases with age. In addition, mean decile scores on all domains are significantly depressed relative to expected average skills for similar age institutionalized populations ($p < .01$ for t tests performed on each Part I domain as compared to the 50th decile, utilizing arcsine transformation of proportion square roots).

To explore further the relationship between age group level and domain deciles, a one-between-one within ANOVA was performed for five

Table 40

Mean Adaptive Behavior Domain Raw Scores by Age Group

	Age Group					
	2-6 years		7-11 years		12-22 years	
Domain	Mean	S.D.	Mean	S.D.	Mean	S.D.
Independent Functioning	28.4	(17.9)	36.0	(25.6)	40.9	(20.0)
Physical Development	15.5	(6.2)	17.4	(6.5)	16.8	(4.7)
Economic Activity	0.1	(0.2)	0.5	(1.6)	0.8	(2.4)
Language Development	8.4	(6.4)	9.8	(10.2)	7.8	(7.3)
Numbers and Time	0.4	(0.9)	1.4	(2.7)	1.4	(3.3)
Domestic Activity	0.8	(1.2)	1.6	(2.8)	3.1	(4.5)
Vocational Activity	0.1	(0.2)	0.6	(1.7)	2.3	(3.5)
Self-Direction	5.2	(4.9)	7.6	(6.4)	7.6	(4.8)
Responsibility	0.7	(1.4)	1.0	(1.7)	1.1	(1.6)
Socialization	7.0	(6.5)	8.5	(6.4)	8.6	(6.3)

Table 41

Mean Adaptive Behavior Domain Deciles by Age Group

	Age Group					
	2-6 years		7-11 years		12-22 years	
Domain	Mean	S.D.	Mean	S.D.	Mean	S.D.
Independent Functioning	45.0	(33.6)	20.0	(24.9)	14.1	(13.7)
Physical Development	59.5	(29.1)	46.6	(37.2)	28.1	(30.7)
Economic Activity	-	-	56.7	(22.5)	34.9	(13.6)
Language Development	57.6	(30.7)	30.4	(30.1)	15.8	(17.6)
Numbers and Time	53.0	(10.0)	44.3	(24.1)	27.1	(22.1)
Domestic Activity	56.0	(7.4)	44.6	(22.5)	32.7	(23.9)
Vocational Activity	-	-	39.0	(24.0)	35.3	(14.7)
Self-Direction	37.3	(31.4)	31.1	(33.1)	19.4	(18.5)
Responsibility	13.0	-	57.2	(25.6)	37.7	(18.9)
Socialization	34.1	(40.4)	23.7	(30.8)	18.8	(25.9)

Note. Deciles, based on institutional norms, are not available for some domains at younger age levels. Domains with less than total number of subjects are Economic Activity, 2-6 year=0, 7-11 year=11; Numbers and Time, 2-6 year=4; Domestic Activity, 2-6 year=4; Vocational Activity, 2-6 year=0, 7-11 year=5; Responsibility, 2-6 year=1, 7-11 year=11. For remaining domains N=22 for 2-6 year, 14 for 7-11, and 36 for 12-22 year olds.

adaptive behavior domains (independent functioning, physical development, language development, self-direction, and socialization; domains with decile standing for most subjects). Follow-up univariate analyses to the obtained, significant age x domain interaction (F [8,276] = 3.02, $p < .003$) yielded significant age group differences for all domains except socialization (independent functioning F[2,69] = 12.05, $p < .0001$; physical development F [2,69] = 7.04, $p < .002$; language development F [2,69] = 19.55, $p < .0001$; and self-direction F [2,69] = 3.44, $p < .04$). Further post hoc analyses with Duncan's multiple range test show that the original interaction term reflects significant decreases ($p < .05$) in mean decile scores for the oldest group as compared to each of the younger groups in independent functioning and language development domains and for the oldest versus the youngest group in physical development and self-direction.

Although number of subjects in conjunction with number of total ABS domains precluded replication factor analysis, simple intercorrelations of domain raw scores support previous findings of a single factor for Part I. Specifically, all Part I domains were significantly correlated with each other at the $p < .003$ to .0001 levels.

Maladaptive Behavior. Consistent with prior research on Part II Maladaptive Behavior, domain raw scores are unrelated to actual chronological age in months (nonsignificant multiple regression analysis, see Table 42 for mean scores by age group). However, as with SIB frequency, upper limits of certain domains are perceived as higher at successive age levels (e.g., inappropriate interpersonal, unacceptable vocal, and sexually aberrant behaviors as well as medication) and are depicted in Figure 10.

Table 42

Mean Maladaptive Behavior Domain Raw Scores by Age Group

	Age Group					
	2-6 years		7-11 years		12-22 years	
Domain	Mean	S.D.	Mean	S.D.	Mean	S.D.
Violent/Destructive Behavior	7.1	(5.8)	7.3	(8.4)	8.2	(8.8)
Antisocial Behavior	4.6	(8.1)	5.6	(7.5)	3.9	(6.3)
Rebellious Behavior	7.8	(8.8)	9.0	(10.0)	7.4	(7.8)
Untrustworthy Behavior	0.3	(0.6)	0.2	(0.6)	0.5	(2.0)
Withdrawal	4.9	(5.3)	6.1	(5.5)	5.8	(5.1)
Stereotyped Behavior	2.8	(3.9)	7.1	(3.7)	5.4	(4.6)
Inappropriate Behavior	0.2	(0.6)	1.1	(1.6)	1.7	(2.1)
Unacceptable Vocal Habits	1.5	(2.1)	2.6	(4.6)	2.3	(2.4)
Unacceptable/Eccentric Habits	3.9	(3.6)	6.2	(3.9)	7.5	(8.7)
Self-Abusive Behavior	3.7	(2.9)	5.6	(2.1)	5.1	(3.3)
Hyperactive Behavior	1.7	(2.4)	3.0	(2.9)	1.1	(2.0)
Sexually Aberrant Behavior	0.3	(0.9)	1.1	(2.7)	1.9	(3.7)
Psychological Disturbances	6.0	(6.5)	6.5	(5.3)	5.4	(5.4)
Use of Medication	0.9	(1.3)	1.1	(1.3)	1.6	(1.7)

Note. Total number of children within each age group is 25 for 2-6 year olds, 14 for 7-11 year olds, and 36 for 12-22 year olds.

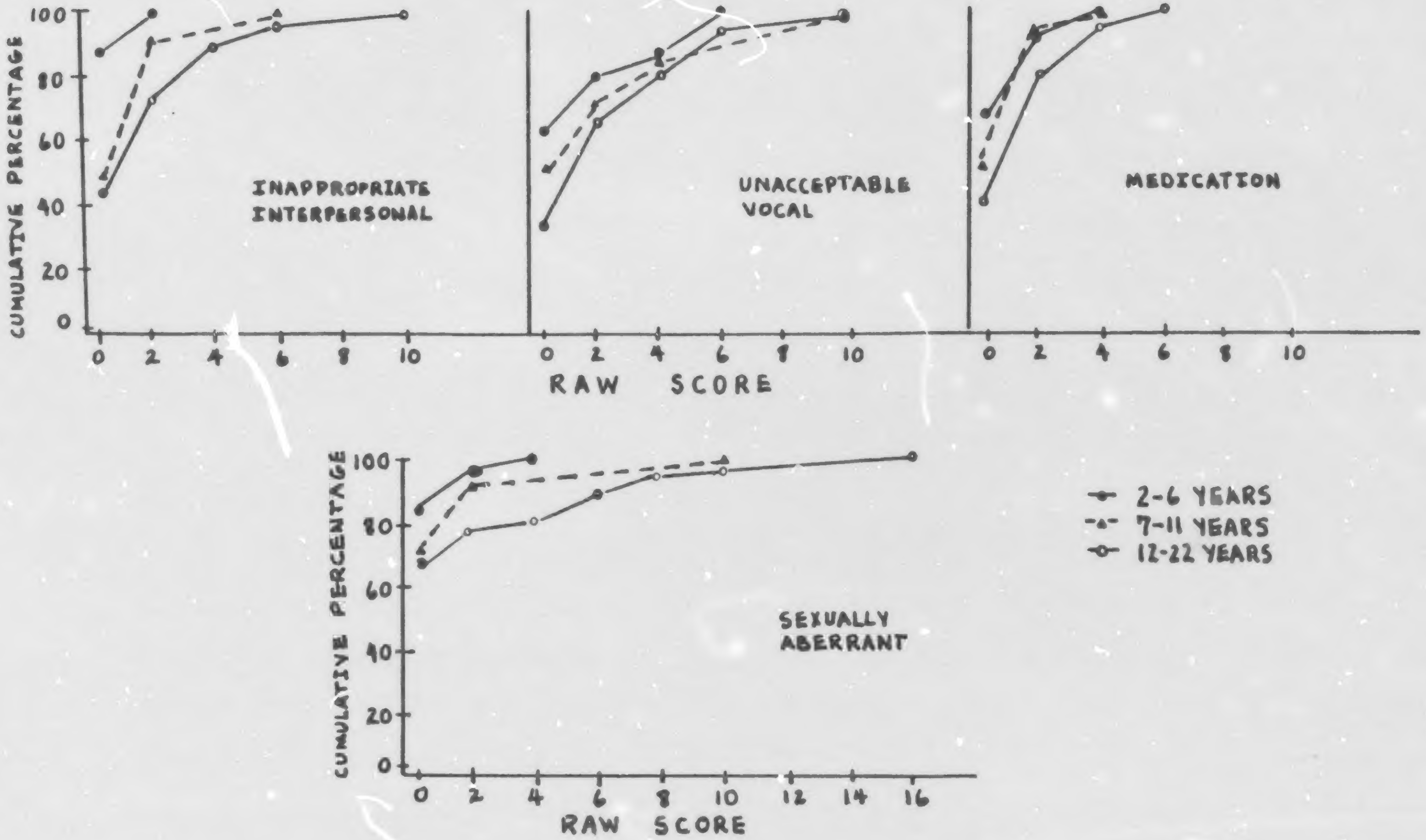


Figure 10. Raw Scores for ABS Part II Domains by Age Group.

To determine whether particular maladaptive behaviors are elevated within the community population of SIBers, several methods were employed. First, those domains with average deciles at or above the 80th decile (considered the cutoff for problematic behavior) were identified. As evident from Table 43, withdrawal, stereotyped, and eccentric behaviors are elevated for both the 7-11 and 12-22 year olds, whereas rebellious behavior is above the 80th decile for 2-6 year olds.

Second, a one between-one within ANOVA was performed for age group with five maladaptive domains; i.e., violent and destructive behavior, withdrawal, stereotyped behavior, unacceptable and eccentric habits, and psychological disturbances. Although no main effect for age group was obtained, the age group x domain interaction term was significant (F[8,275]= 2.77, $\underline{p} < .0001$) as well as the main effect for domain (F[4,275] =9.26, $\underline{p} < .0001$). These results were due to significantly higher scores for the two older groups as compared to the youngest group in the stereotyped behavior domain ($\underline{F}[2,69] = 5.69$, $\underline{p} < .005$, post hoc $\underline{p} < .05$) and for the oldest versus the youngest group in eccentric habits ($\underline{F}[2,69] = 6.34$, $\underline{p} < .003$, post hoc $\underline{p} < .05$). In addition, decile standing on psychological disturbances was significantly lower for the older as compared to the younger group ($\underline{F}[2,69] = 5.56$, $\underline{p} < .004$, post hoc $\underline{p} < .05$). A separate one between ANOVA for medication yielded no significant age group differences.

Third, the interrelationship of Part II domains with the self-abusive behavior domain was explored. The mean SIB decile score was positively correlated with mean stereotyped and hyperactive behavior domain deciles ($r = 0.58$, $\underline{p} < .0001$ and $r = 0.66$, $\underline{p} < .0001$) and negatively with mean withdrawal and eccentric behavior domain deciles ($r = -0.60$, $\underline{p} < .0001$ and $r = -0.86$, $\underline{p} < .0001$).

Table 43

Mean Maladaptive Behavior Domain Deciles by Age Group

	Age Group					
	2-6 years		7-11 years		12-22 years	
Domain	Mean	S.D	Mean	S.D.	Mean	S.D.
Violent/Destructive Behavior	78.3	(24.4)	66.2	(21.3)	74.0	(17.5)
Antisocial Behavior	75.5	(19.8)	63.9	(21.0)	51.0	(21.1)
Rebellious Behavior	86.4	(20.5)	72.9	(25.7)	69.6	(22.1)
Untrustworthy Behavior	-	-	-	-	54.2	(9.1)
Withdrawal	71.2	(22.6)	81.3	(14.8)	79.6	(16.7)
Stereotyped Behavior	76.4	(16.2)	91.6	(10.7)	83.6	(19.8)
Inappropriate Behavior	-	-	-	-	75.2	(18.0)
Unacceptable Vocal Habits	-	-	-	-	79.6	(13.3)
Unacceptable/Eccentric Habits	75.4	(15.1)	83.4	(10.0)	86.9	(10.3)
Self-Abusive Benavior	81.0	(14.9)	96.3	(3.9)	95.8	(4.5)
Hyperactive Behavior	75.3	(16.9)	76.9	(15.4)	73.5	(11.3)
Sexually Aberrant Behavior	60.0	-	51.0	-	71.9	(14.3)
Psychological Disturbances	79.7	(17.5)	72.1	(25.0)	61.4	(21.5)
Use of Medication	69.3	(19.7)	70.0	(15.6)	70.4	(18.8)

Note. Deciles, based on institutional norms, are not available for certain domains at younger ages. Reduced number of subjects for domains within the 2-6 year group is Domain I=21; II=15; III=15; IV=0; VII=0; VIII=0; X=4; XI=15; XII=1 (total N=22); and for 7-11 year olds is Domain IV=0; VII=0; VIII=0; and XII=1.

Interrelationship of ABS and SIB Teacher Perception Questionnaire. No significant canonical variates were obtained for raw scores on five Part I and four Part II domains (independent functioning, language development, numbers and time, domestic activity, socialization, violent and destructive behavior, withdrawal, stereotyped behavior, and medication) with four SIB parameters and five SIB topographies (highest SIB frequency, number antecedents, number general topographies, number topography subtypes, head banging, biting self, face hitting, hair pulling, and digging/scratching). However, significant simple correlations were obtained for a negative relationship of highest SIB frequency since September with domain deciles for independent functioning ($r = -0.25$, $p < .04$), language development ($r = -0.26$, $p < .03$), and domestic activity ($r = -0.31$, $p < .03$), suggesting that higher SIB frequency is associated with lower levels of communicative behavior and independent and daily living skills.

Modest but significant, simple correlations also were obtained for specific antecedents to SIB with ABS Part I and Part II domains. Higher independent functioning skills (decile) are negatively correlated with approaches certain areas ($r = -0.25$, $p < .04$) and positively correlated with "other" ($r = 0.24$, $p < .05$). Conversely, lower socialization behavior raw scores are associated with SIB when left alone (-0.27, $p < .02$) and following unexpected sounds or movements ($r = -0.34$, $p < 0.003$); and lower socialization deciles with unexpected environmental events, adult approach, and transitions ($r = -0.30$, $p < .01$; $r = -0.25$, $p < .05$; $r = -0.27$, $p < .03$).

For Part II raw scores, more frequent SIB when left alone correlates significantly with both eccentric and self-abusive behavior ($r = 0.27$, $p < .02$ and $r = 0.31$, $p < .008$); and SIB following change in routines with stereotyped, inappropriate, and unacceptable vocal habits ($r = 0.23$, $p < .05$;

$r = 0.23$, $p < .05$; $r = 0.25$, $p < .04$). Children whose SIB is in response to adult attempts to terminate self-stimulatory or other inappropriate behaviors also tend to engage in these behaviors more frequently (violent and destructive behaviors, $r = 0.28$, $p < .02$; stereotyped behavior, $r = 0.25$, $p < .04$; and unacceptable or eccentric habits, $r = 0.27$, $p < .02$). And, finally, teachers have more difficulty identifying antecedents to SIB for children who are more withdrawn (no reason with withdrawal, $r = 0.30$, $p < .01$).

Interrelationship of ABS and Antecedent/Consequent Card Sort. Unlike findings for general antecedents on the questionnaire, major clusters on the Antecedent/Consequent Card Sort are unrelated to Part I Adaptive Behavior domains (nonsignificant canonical and simple correlations). However, children who exhibit SIB more frequently following avoidance behavior (Cluster 3, $R^2=0.41$ with the variate) also are perceived to engage generally in more violent and destructive ($R^2=0.39$) and rebellious behavior ($R^2=0.35$), as shown by the following canonical variate ($F[20,199.95]=3.03$, $p < .0001$): $-0.3446(\text{Cluster 1}) + 1.1827(\text{Cluster 3}) - 0.1290(\text{Cluster 4}) + 0.01(\text{Cluster 5}) + 0.03(\text{Cluster 11}) = 0.6398(\text{VD}) + 0.4360(\text{Reb}) - 0.2344(\text{WD}) + 0.0029(\text{ST})$.

Part II: Cognitive Assessment

Cognitive Functioning Levels of SIBers

Of the 43 SIBers in the high rate group and assessed in Part II of this study, 30 performed within the sensori-motor period, 12 within the preoperational period, and one within the concrete operations period of cognitive development. The number and average ages of children functioning at these levels within age groups is outlined in Table 44.

Table 44

Number and Mean Age of Children by Age Group

for Cognitive Functioning Levels

	Age Group								
	2-6 years			7-11 years			12-22 years		
Functioning Level	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Sensori-motor	6	45.2	(13.1)	8	107.8	(15.2)	16	196.9	(25.5)
Preoperations	1	44.0	(0.0)	1	114.0	(0.0)	10	206.0	(39.8)
Concrete operations	0	-	-	0	-	-	1	259.0	(0.0)

Note. Mean ages are in months

Sensori-motor assessment. Performance on the sensori-motor assessment was analyzed in three ways: by number of items passed, by mental age equivalents, and by specific stage placement. In general, age group means were similar on all measures (see Table 45) with a tendency toward slightly higher functioning within the 12-22 year group and lowest functioning by the 7-11 year group.

Table 45

Mean Raw Score, Mental Age, and Stage Placement by Age Group on Sensori-Motor Assessment Subscales

	Age Group					
	2-6 years		7-11 years		12-22 years	
Subscale	Mean	S.D.	Mean	S.D.	Mean	S.D.
	Raw Score					
OP	8.2	(3.4)	7.8	(5.0)	9.2	(3.5)
ME	9.0	(2.7)	6.6	(2.4)	9.1	(2.5)
CA	7.0	(2.8)	6.6	(2.4)	7.6	(1.2)
SR	7.5	(2.6)	6.6	(3.2)	8.4	(1.8)
SCH	9.0	(3.0)	8.0	(2.6)	9.8	(0.7)
GI	6.0	(3.4)	6.7	(3.7)	8.4	(4.2)
	Mental Age Equivalent					
OP	11.5	(4.6)	11.4	(7.8)	14.5	(5.9)
ME	12.5	(4.4)	10.0	(4.5)	14.7	(4.3)
CA	15.2	(7.3)	13.8	(6.6)	16.3	(4.3)
SR	13.5	(4.1)	10.9	(4.9)	13.8	(3.0)
SCH	13.5	(5.6)	10.6	(4.4)	14.8	(1.2)
GI	9.3	(2.9)	10.3	(3.7)	12.9	(4.9)
	Stage Placement					
OP	4.8	(1.0)	4.6	(1.7)	5.3	(1.1)
ME	5.2	(1.0)	4.6	(1.1)	5.5	(0.8)
CA	5.5	(1.5)	5.3	(1.3)	5.8	(0.7)
SR	4.9	(1.0)	4.6	(1.2)	5.4	(0.6)
SCH	5.2	(1.1)	4.8	(1.0)	5.5	(0.2)
GI	4.4	(0.8)	5.1	(1.2)	4.9	(0.9)

Note. OP=Object permanence; ME=Means-end; CA=Causality; SR=Spatial relations; SCH=Object schemes; GI=Gestural imitation.

Average number of items passed on each subscale for the overall group was 8.6 for object permanence (out of a possible 13 items), 8.4 in means-end (out of 13 items), 7.2 in causality (out of 9 items), 7.7 for spatial relations (out of 12 items), and 9.2 for object schemes (out of 13 items). Complete protocols were obtained for 18 children in motor-gestural imitation (mean number of items passed = 7.3 out of 14 total). Although insufficient information was obtained for the verbal imitation scale to enable discussion of subscale scores, at least two-thirds of children exhibited no more than positive response to adult vocalization, and infrequent, restricted self-stimulatory vocalizations.

The average mental age equivalent for the five complete subscales combined was 13.2 months (S.D.=4.1, range=4.4-19.4). Average performance was highest in the causality area (mean age=15.4 months, S.D.=5.5); approximately equal in object permanence, means-end, spatial relations, and object schemes (mean ages=13.1, 13.0, 13.0, and 13.5 months; and S.D.s= 6.2, 4.7, 3.9, and 3.7, respectively), and lowest in gestural imitation (mean age=11.2, S.D.=4.1).

Average stage placement for the five object-related subscales is beginning stage V with 13% of children functioning within sensori-motor Stage III, 23% at Stage IV, 43% at Stage V, and 20% at Stage VI. The pattern of children falling within each stage at each age level, outlined in Figure 11, shows the oldest group comprising a greater percentage of higher functioning children, and the 7-11 year group including relatively more lower functioning individuals.

Hierarchical cluster analysis, undertaken to investigate congruence of stage placement among object-related subscales, yielded intercorrelations of .60-.82. Clusters obtained and diagrammed in Figure 12 were:

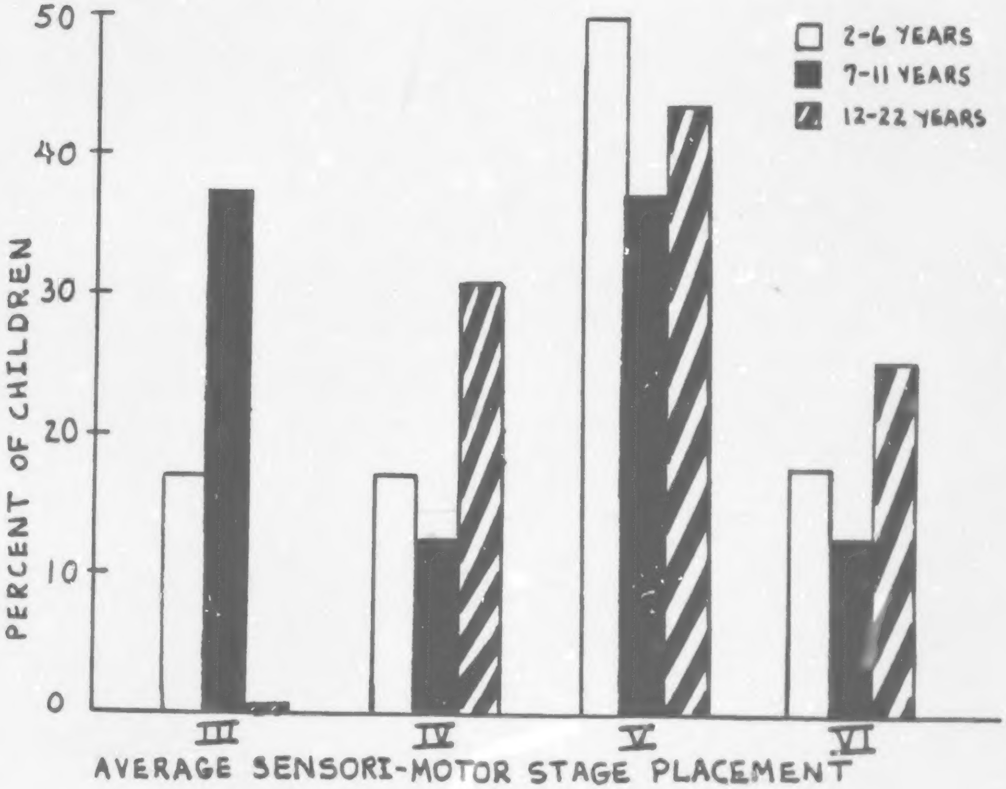


Figure 11. Average Sensori-Motor Stage Placement by Age Group.

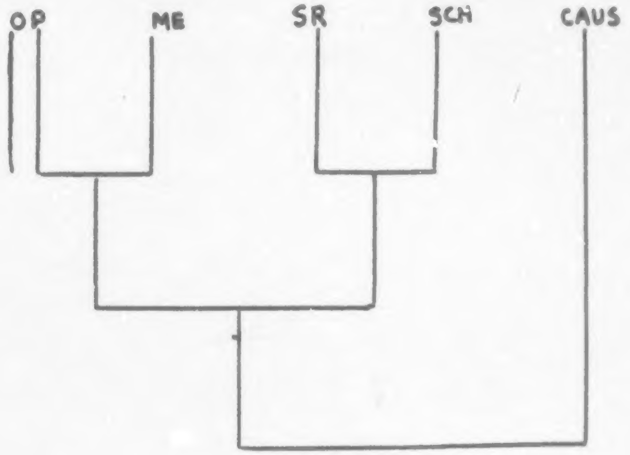


Figure 12. Hierarchical Cluster Diagram of Sensori-Motor Assessment Subscales.

1. object permanence alone; 2. object permanence with means-end; 3. spatial relations and object schemes; 4. object permanence, means-end, spatial relations, and object schemes; and 5. all five subscales combined. Causality correlated least well with the other four subscales (≤ .064 with object permanence, 0.64-0.67 with means-end and spatial relations, and 0.71-0.74 with object schemes). Similarly, Chronbach's alpha or measure of concordance indicates high homogeneity among subscales (alpha=0.93) which does not change if causality is removed, but becomes lower if any of the other subscales are removed. In addition, the extent to which the causality subscale is associated with the overall statistic is considerably lower than for other subscales (squared multiple correlation for causality = 0.55).

In contrast to analysis of variables, hierarchical cluster analysis of children's profiles shows considerable variability in stage placement across object-related subscales. Of the total group, only three children exhibited performance confined to a single sensori-motor stage (one in Stage IV and two in Stage V). Patterns obtained for abilities spanning two stages were as follows: 1. predominant performance in Stage V with possible Stage IV behavior in one or more areas, most frequently object permanence or causality (N=8); 2. mixed Stage V/Stage VI abilities with highest performance in causality (N=5); 3. primarily Stage VI performance with Stage V behavior in spatial relations and object schemes (i.e., symbolic deficits, N=3); 4. primarily Stage IV behavior with depressed Stage III performance in object permanence and spatial relations (N=2); and 5. end Stage II/beginning Stage III abilities (N=2). Among remaining children, seven exhibited performance levels spanning three or more stages (Stage IV-VI=1, Stage III-VI=1, Stage III-V=3, and Stage II-IV=2). Within these profiles, lowest performance was in object permanence, and highest performance was in causality (N=4), object schemes (N=2), or means-end (N=1).

Guttman scalogram analyses for each subscale yielded optimum item orderings which are slightly different than those listed in the source tests from which the assessment was derived. Corrected ordinal placements for items within each subscale are listed in Table 46. Suggested changes in the object permanence subscale improve reproducibility from 0.71 to 0.96 (coefficient of scalability=0.87). The major change within the subscale places sequential visible displacement with three screens after, rather than before, invisible displacement with one screen and randomly between two screens.

Changes within the means-end area (minimum marginal reproducibility improved from 0.81 to 0.96, coefficient of scalability=0.78) are consistent with the author's experiences with both SIB and non-SIB individuals with developmental delays. Specifically, support items are more difficult than items involving attached tools, and foresight with the solid ring is easier than the corresponding task of necklace and container.

Particular items reflecting referential or symbolic behavior appear to be more difficult for the SIB population than for the normal infant population on which the items were scaled. This deficit is evident in both causality and object schemes where specific procedures to reinstate events and giving objects for assistance in the former and showing objects in the latter are placed higher on the respective scales. By reordering items, the marginal reproducibility for causality improves from 0.83 to 0.98 (coefficient of scalability=0.88) and for object schemes from 0.94 to 0.99 (coefficient of scalability=0.94). In addition, movement from

Table 46

Corrected Item Order for Sensori-Motor Subscales

Item Order Within Subscales[a]	Percent Passing
Object Permanence	
13. Reverse, invisible sequential, three screens	30%
12. Invisible sequential, three screens	49%
11. Invisible sequential, two screens	52%
8. Visible sequential, three screens	55%
10. Invisible random alternation, two screens	59%
9. Invisible displacement, one screen	68%
7. Visible sequential, two screens	68%
6. Visible random alternation, two screens	71%
5. Visible displacement, one screen	81%
4. Look for reappearance of moving object	81%
3. Partially covered object	94%
2. Watch point of disappearance	100%
Means-End	
12. Foresight, necklace and container	13%
13. Foresight, solid stacking ring	17%
11. Unattached tool, rake	30%
10. Support, reach to object held above[b]	36%
9. Support, pull to obtain object[b]	49%
6. Barrier, vertical screen	71%
8. Attached tool, vertical string and cup	75%
7. Attached tool, horizontal string and cup	78%
5. Visually directed reach	91%
4. Visually directed grasp	97%
3. Repeat early motor movement	100%
2. Hand watching	100%
Causality	
9. Activate mechanical toy without demonstration	39%
8. Activate mechanical toy with demonstration	46%
7. Give object for assistance	59%
3. Specific procedure to reinstate event	91%
6. Activate mechanical toy manually	94%
5. Activate manual toy manually	94%
4. Touch object to reinstate event	94%
2. Repeat early motor movement	100%
1. Hand watching	100%
Spatial Relations	
12. Indicate whereabouts of absent person	4%
11. Understand gravity (incline)	21%
10. Detour around barrier	21%
9. Stack two blocks	42%
8. Reverse container to empty contents	63%

Table 46 (continued)

Item Order Within Subscales[a]	Percent Passing
Spatial Relations (continued)	
7. Put objects into container	69%
5. Recognize reverse side of object	87%
6. Take objects out of container	90%
4. Lean to follow trajectory of moving object	90%
3. Visually track object 180°	94%
2. Alternate gaze between two objects	100%
1. Visually localize source of sound	100%
Object Schemes	
13. Pretend behavior	4%
11. Show objects	7%
12. Name objects	7%
10. Functional use, two objects	65%
9. Functional use without demonstration, one object	78%
8. Functional use with demonstration, one object	84%
7. Letting go	91%
6. Complex schemes	91%
5. Examine objects	94%
4. Beginning differentiation of schemes	100%
3. Simple schemes	100%
2. Visually inspect objects	100%
Gestural Imitation	
15. Deferred imitation	6%
14. Complex new movements	11%
13. Unfamiliar visible, immediate imitation	11%
11. Unfamiliar invisible, one action	22%
9. Unfamiliar visible	22%
12. Complex movements, approximation	27%
8. Unfamiliar visible, gradual approximation	48%
10. Unfamiliar invisible, some action	53%
7. Familiar invisible, gradual approximation	64%
6. Familiar visible expansion, immediate imitation	69%
5. Familiar visible, immediate imitation	74%
4. Familiar visible expansion, some action	85%

Note. Item reordering is based on Guttman scalogram analysis. Since scalogram analysis was limited to 12 items, lowest items on subscales exceeding this limit were deleted.

[a] Item numbers reflect original order in Sensori-motor Assessment.

[b] Placement of support items was changed from preceding to following items with attached tools; scalogram results support this change.

functional use of objects to both referential and symbolic behaviors represents a marked jump in difficulty level (65% of children engaging in functional use of two related objects and 7% or less exhibiting naming, showing, or pretend behaviors).

Related findings with the gestural imitation subscale (improvement in reproducibility from 0.75 to 0.95, coefficient of scalability=0.79) show that performance of some movement and gradual approximation were easier than immediate imitation of both unfamiliar visible and invisible actions. In addition, immediate imitation of complex movements (two combined) and invisible imitation were quite difficult for this population (11% of children passing these items). Many children who exhibited difficulty imitating unfamiliar actions (visible, invisible, complex) without objects were observed to immediately imitate such actions with objects. The addition of items which distinguish these two types of behavior (with and without objects) and investigation of their appropriate scale placements would assist further in assessment of SIBers' gestural imitation abilities.

As found by other researchers, the coefficient of scalability is poorest for the spatial relations scale (r=0.61). However, it is not clear whether reorderings from the scalogram analysis reflect more general acquisition patterns or are specific to this SIB population (improvement obtained from initial marginal reproducibility of 0.84 to coefficient of reproducibility=0.94). For example, taking objects out of containers is easier than recognizing objects when reversed, and leaning to follow the trajectory of items is equally as difficult as taking objects out of containers (rather than easier). In addition, the ability to put objects into containers appears to be more difficult than previously supposed, following the object reversal and trajectory items rather than the taking out of containers item.

Preoperational assessment. Best performance, and in some cases only successful performance, was obtained for seven children on the Leiter, three children on the PPVT, one child equivalently on the Leiter and the PPVT, and for two on the Perkins-Binet[1] (one on Form U and one on Form N). Average mental age (MA) for the group as a whole was 45.3 months (S.D.= 19.1); and average MA at each successive age group was 44.0 months for 2-6 year olds (S.D.= 0.0, N=1), 38.0 months for 7-11 year olds (S.D.= 25.5, N= 2), and 46.9 months for 12-22 year olds (S.D.=19.8, N=10). Mean IQ for the group was borderline severe to moderate; mean=37.7, S.D.=26.2, range=12-100.

Clinical observation indicated that all children exhibited language delays or disorders of some type. This was evident in differential performance on tests as well as from language behavior during testing. Estimated mean length of utterance (MLU) determined following testing was considerably below expected MLUs for intellectual performance levels (see Table 47).

Sensori-motor and preoperational levels combined. When mental ages for all children are considered, average MA is 22.9 months (based on average subscale performance for sensori-motor level children and best test performance for preoperational level children). As shown in Figure 11, the MA distribution for SIBers corresponds to the CA distribution previously reported for normal children.

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[1] Performance items on the Perkins-Binet were used with preoperational deaf-blind children, since no other standardized instrument exists for use with low vision, profoundly deaf children.

Table 47

Preoperational Children's Sentence Length During Assessment

		Predominent Sentence Length			Longest Sentence			
Mental Age and Modality	(N)	Mean	S.D.	Range	Mean	S.D.	Range	Expected M.L.U.
2 to 3 years	(6)	1.0	0.6	(0-2)	2.0	2.0	(0-5)	2.5-3.0
Speech	(3)	1.3	0.6	(1-2)	3.3	2.1	(1-5)	
Sign	(3)	0.7	0.6	(0-1)	0.7	0.6	(0-1)	
4 to 7 years	(3)	1.3	1.2	(0-2)	1.7	1.5	(0-3)	4.0+
Speech	(2)	2.0	(0.0)	(2)	2.5	0.7	(2-3)	
Sign	(1)	0.0	(0.0)	(0)	0.0	0.0	(0)	

Note. Based on 9 out of 13 children functioning within the preoperational period of cognitive development.

Interrelationship of Cognitive Assessment and SIB Teacher Perception Questionnaire

No linear relationship was obtained between average MA for the total group (nonsignificant multiple regression analysis) or for sensori-motor subscale performance (nonsignificant canonical correlation) and SIB parameters (lowest frequency, highest frequency, number of antecedents, number general topographies). However, a quadratic relationship does appear to exist between MA level and SIB frequency. As depicted in Figure 13, SIB frequencies are highest among children at average sensori-motor Stages IV, V, and VI, and relatively lowest among sensori-motor Stage III and preoperational level children. However, when MA level is analyzed separately a steep negative linear pattern is evident for the 12-22 year old group, but not for the younger age groups (see Figure 14). The opposite pattern is evident for number of general topographies; i.e., greater mean number at Stage III (mean=4.5), comparative decrease with steady increase in mean number of topographies up through MA of 24 months (Stage IV=2.2, Stage V=3.2, Stage VI=4.0, 2-3 years=2.1, and 4-7 years=2.8).

Although preoperational children's MAs were unrelated to antecedents to SIB, sensori-motor level children's performance on specific subscales did yield significant simple correlations. Higher performance on means-end and object schemes subscale was positively related to more frequent SIB in response to behavior requests by adults ($r = 0.48$, $p < .01$ for stage placement on both subscales). And "no reason" was scored by teachers as more frequent for children with lower performance on all subscales (object permanence, $r = -0.55$, $p < .002$; means-end, $r = -0.50$, $p < .006$; causality, $r = -0.41$, $p < .03$; spatial relations, $r = -0.54$, $p < .004$; and object schemes, $r = -0.57$, $p < .001$).

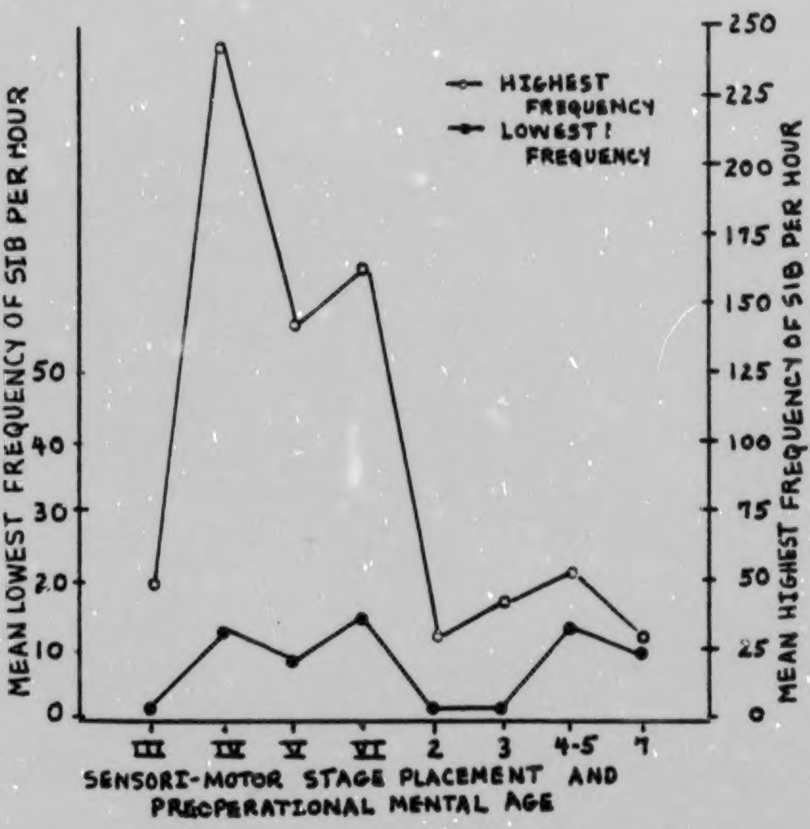

Figure 13. Mean Lowest and Highest Frequency of SIB by Sensori-Motor Stage Placement and Preoperational Mental Age.

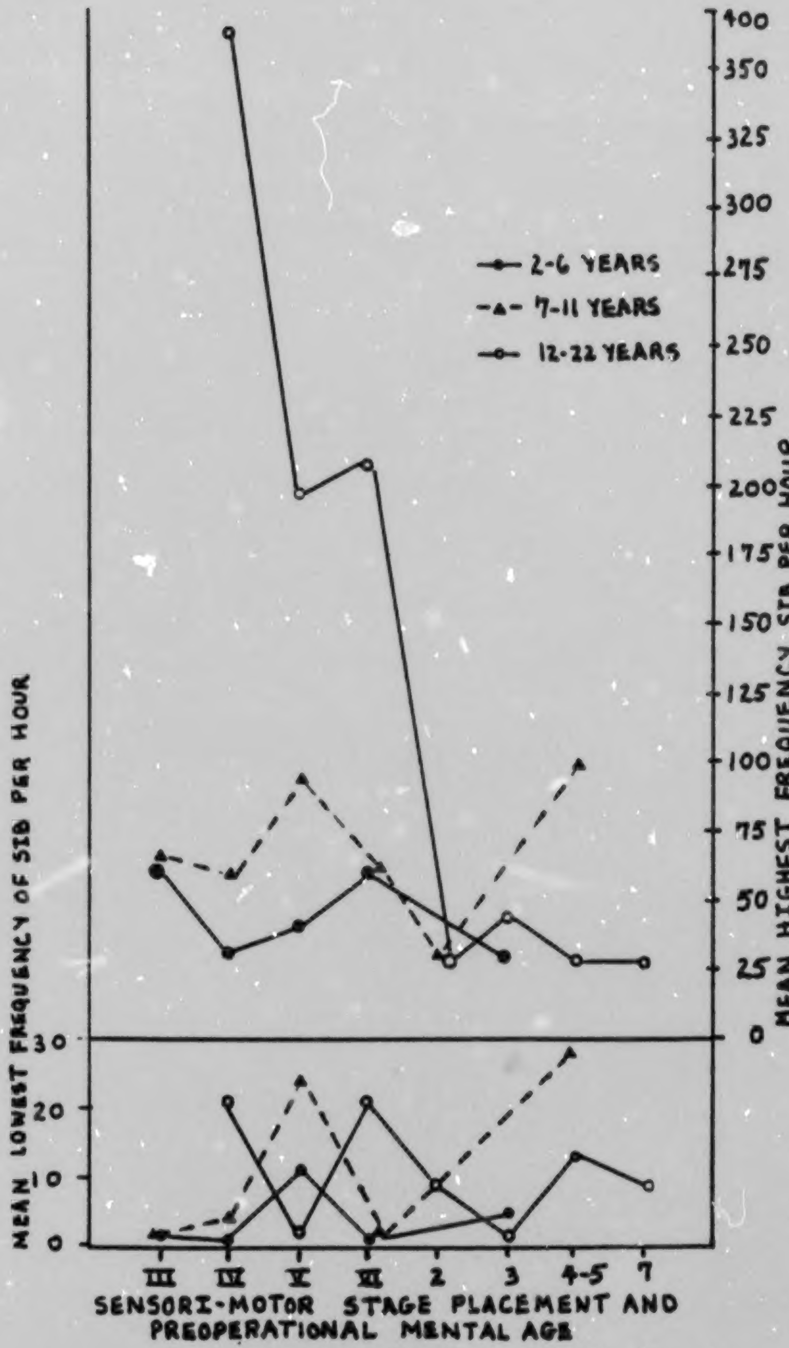

Figure 14. SIB Frequency by Age Group for Sensori-Motor Placement and Preoperational Mental Age.

Interrelationship of Cognitive Assessment and Antecedent/Consequent Card Sort

The following significant canonical variate accounted for 64% of the variance between sensori-motor subscales and major antecedent clusters ($F[25,53.51]=1.81$, $p=<.04$: $-0.3845(\mathrm{OP}) - 0.8313(\mathrm{ME}) - 0.6881(\mathrm{CAUS}) + 0.0304(\mathrm{SR}) + 1.512(\mathrm{SCH}) = -1.277$ (Mands) $+ 0.9702$(Avoidance) $- 0.2901$ (Visual Stimuli) $+ 0.1652$(Physical/Tactile Contact) $+ 0.6959$(Appropriate Behavior). Inspection of the squared correlations for variables with the variate reveals that object permanence, means-end, and causality (accounting for 7%, 14%, and 8% of the variance) are negatively related to Cluster 3 Avoidance Escalation (19% of variance) and positively related to Cluster 1 Presentation of and Reaction to Mands. Stated another way, children who are cognitively more advanced in these areas are less likely to embed SIB in escalating avoidance behavior and are more likely to react to implicit and explicit demands by engaging in SIB. Although object schemes is uncorrelated with the variate ($R^2=.01$), higher object schemes performance appears to be related to more frequent SIB following avoidance escalation ($r=0.48$, $p<.01$), as shown by weights in the canonical correlation equation.

Of additional interest is the tendency of teachers to use material restraints with lower functioning SIBers (Cluster 9 with object permanence and causality, $r=-0.37$, $p<.04$ and $.05$). Surprisingly, SIB following loud and unexpected sounds (Cluster 8) was more often attributed to higher functioning individuals ($r=0.39$, $p<.03$ with object permanence; $.036$, $p<.05$, causality; $.045$, $p<.02$, spatial relations; and 0.51, $p<.03$, gestural imitation).

Interrelationship of Cognitive Assessment and ABS

To test the relationship of average MA for the group as a whole with raw scores on the ABS, multiple regression analyses were carried out for selected domains. For Part I Adaptive Behavior, both independent functioning (partial $F[1,37] = 69.23$, $p < .0001$) and language development (partial $F[1,37] = 26.24$, $p < .0001$) but not socialization raw scores were predictive of MA, where $MA=0.64(IF) + 11.87(LD) - 0.32(SOC)$. Among selected Part II domains, only withdrawal was significantly related to MA ($F[1,34] = 9.23$, $p < .005$). The multiple regression equation ($F[5,34] = 2.52$, $p < .05$) shows that withdrawal decreases as MA increases: $MA=6.24(VD) + 0.33(Reb) - 1.72(WD) + 0.83(ST) - 0.10(EC)$.[1]

Significant canonical variates were also obtained for these same Part I ($F[15,52.85] = 2.27$, $p < .02$) and Part II domains ($F[25,60.94] = 2.18$, $p < .007$) with the object related sensori-motor subscales and account for 60% and 65% of the variance, respectively, in these measures. The specific variates obtained are as follows: $0.69(IF) + 0.24(LD) + 0.35(SOC) = 0.28(OP) + 0.95(ME) + 0.04(CA) + 0.01(SR) - 0.30(SCH)$; and $0.99(VD) - 0.38(Reb) + 0.47(WD) + 0.40(ST) - 0.77(EC) = 0.51(OP) - 1.35(ME) + 0.10(CA) + 1.23(SR) - 0.78(SCH)$.[2]

As might be expected, preoperational level SIBers' MAs were significantly correlated with their raw scores on all Part I Adaptive Behavior domains except physical development and responsibility (simple correlations ranged from 0.56 to 0.81, $p < .03$ to .0006). Domains which do not involve preoperational level abilities were also positively related to MAs obtained on sensori-motor subscales. Independent functioning correlated significantly with performance on all subscales ($r = 0.39$ to 0.68, $p < .04$ to .0001); physical development with object permanence, means-end, causality, and spatial relations ($r = 0.45$ to 0.52, $p < .02$ to .001); and domestic activity with all subscales except object schemes ($r = 0.38$ to 0.68, $p < .05$ to .0006). Interestingly, higher language development scores were associated with higher MAs on object permanence, spatial relations, and object schemes subscales ($r = 0.38$ to 0.47, $p < .05$ to .008), but not with the two subscales most recently researched and reported in the literature (means-end and causality). And, finally, self-direction and socialization were related to object permanence and means-end performance (0.36 to 0.55, $p < .05$ to .002).

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[1] VD=violent and destructive behavior; Reb=rebellious behavior; WD=withdrawal; ST=stereotyped behavior and odd mannerisms; EC=unacceptable or eccentric habits.

[2] OP=object permanence; ME=means-end; CA=causality; SR=spatial relations; and SCH=object schemes.

Whereas chronological age previously was found to be unrelated to Part II Maladaptive Behavior, MA does appear to be related to at least certain maladaptive behavior domains. For example, individuals with higher withdrawal raw scores tend to have lower MAs on preoperational assessments ($r = 0.54$, $p < .05$) or on means-end and object schemes subscales ($r = -0.44$, $p < .01$ and $r = -0.38$, $p < .05$, respectively). Similarly, less stereotyped behavior is associated with higher means-end, causality, and object schemes performance ($r = -0.55$, $p < .002$; $r = -0.48$, $p < .008$; and $r = -0.41$, $p < .03$).

Part III: Standard Activities

Condition Effects

Separate two between-one within ANOVAs for age group x order x time were performed to determine the effects of standard activities on SIB, negative/manipulative, correct, and error frequencies.[1] In addition, a priori orthogonal contrasts were carried out to test the hypotheses that the easy and preferred tasks would result in higher correct responding and lower SIB, negative/manipulative behavior, and error responses; and that the difficult and nonpreferred tasks would generate the opposite pattern. Square root transformations were applied to SIB and error scores, since the means for these variables were proportional to respective standard deviations at each level of time.

Consistent with the hypothesized effect of task condition on behavior frequencies, significant time x order interactions were obtained for all four variables; SIB, $\underline{F}(5,180)=2.68$, $\underline{p} < .02$; negative/manipulative behavior, $\underline{F}(5,180)=5.71$, $\underline{p} < .0001$; correct response, $\underline{F}(5,180)=17.6$, $\underline{p} < .0000$; and error response, $\underline{F}(5,180)=34.14$, $\underline{p} < .0000$. As depicted in Figure 15, these interactions conformed to the expected pattern of Order 1 and 2 being mirror images of each other (significant quintic interactions for order x

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[1] The first five children assessed did not receive Time 6 (one 2-6 year old and four 12-22 year olds), and one child (7-11 years old) was administered the preferred-nonpreferred sequence in reversed order by his teacher. These children were deleted from ANOVAs, resulting in the following distributions for Orders 1 and 2: four and six 2-6 year olds, five and four 7-11 year olds, and 10 and 13 12-22 year olds. All 48 subjects were included in other analyses that were unaffected by missing components.

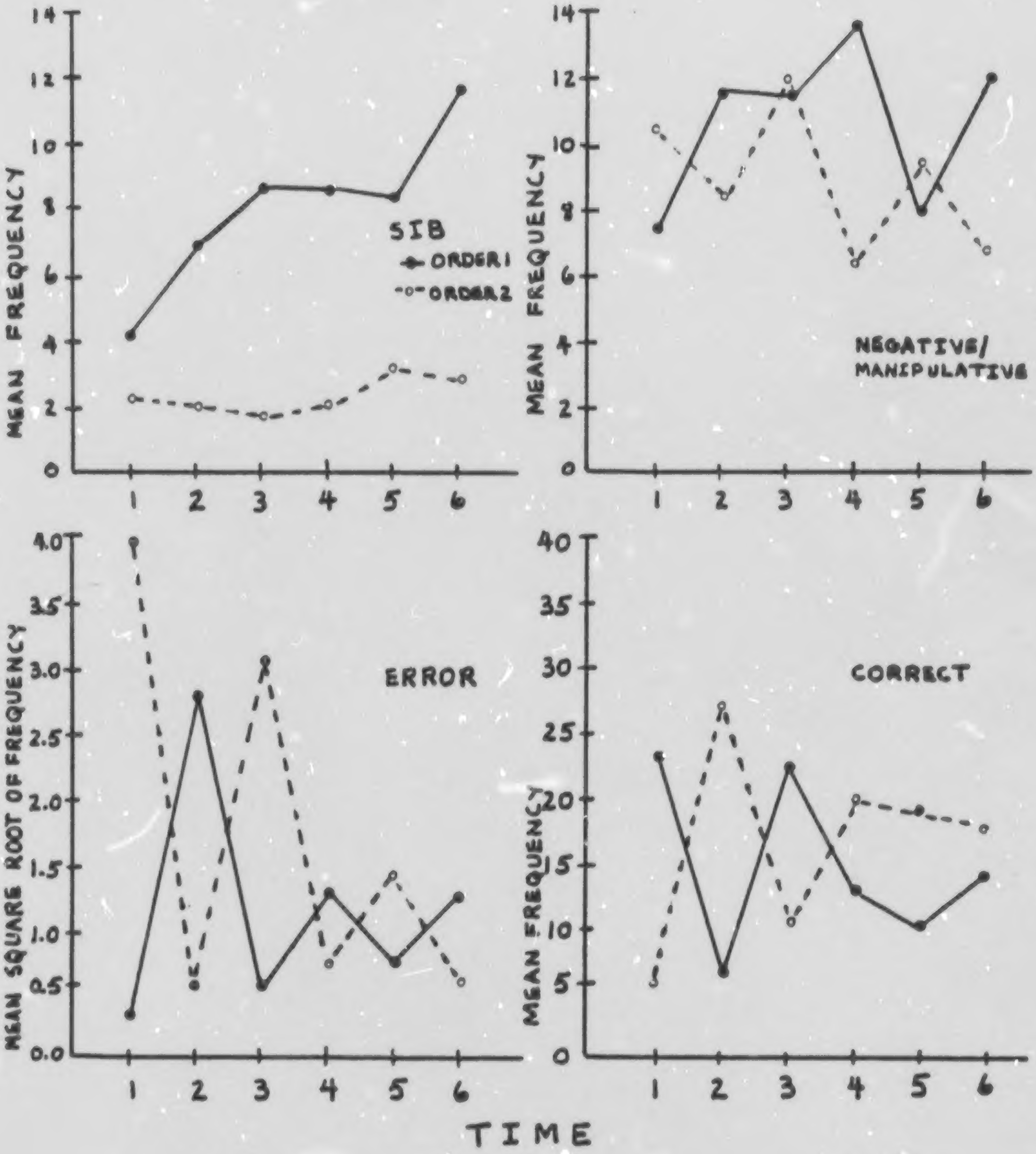

Figure 15. Mean Frequencies of Behaviors During Standard Activities by Order and Time.

time) for all variables except SIB, which showed a significant linear effect for time; SIB linear, $F(1,36)=4.49$, $p<.04$; negative/manipulative quintic, $F(1,36)=14.69$, $p<.0005$; correct quintic, $F(1,36)=19.95$, $p<.0001$; and error quintic, $F(1,36)=64.64$, $p<.0000$. To clarify the relationship among behaviors, the four variables are juxtaposed in Figure 15 for Orders 1 and 2 separately.

Significant age differences also were obtained for negative/manipulative behaviors ($F[2,36]=4.20$, $p<.02$) and correct responses ($F[2,36]=4.30$, $p<.02$). Specifically, as the mean frequency of negative behaviors per 5 minutes of task decreased at successive age levels (2-6 years=15.4, 7-11 years=9.8, and 12-22 years=5.4), the mean frequency of correct responding increased (2-6 years=7.1, 7-11 years=10.8, and 12-22 years=18.8). The age differences for negative/manipulative behavior also interacted significantly with order and time; $F(10,80)=3.05$, $p<.001$. The obtained, quintic pattern is depicted in Figure 16; age x order x time, $F(2,36)=5.64$, $p<.0007$.

As intended in task construction, errors were more frequent in Order 2 (containing the repeated difficult task) than in Order 1 (comprising the repeated easy task); main effect for order, $F(1,36)=10.24$, $p<.003$. In addition, errors were more frequent in the project-designed difficult task than in the nonpreferred task chosen by the teacher; main effect for time, $F(5,180)=9.51$, $p<.0000$.

Subgroup Analyses

Two types of subgroup patterns were investigated. The first concerned differences between Orders 1 and 2, and the second focused on within order patterns.

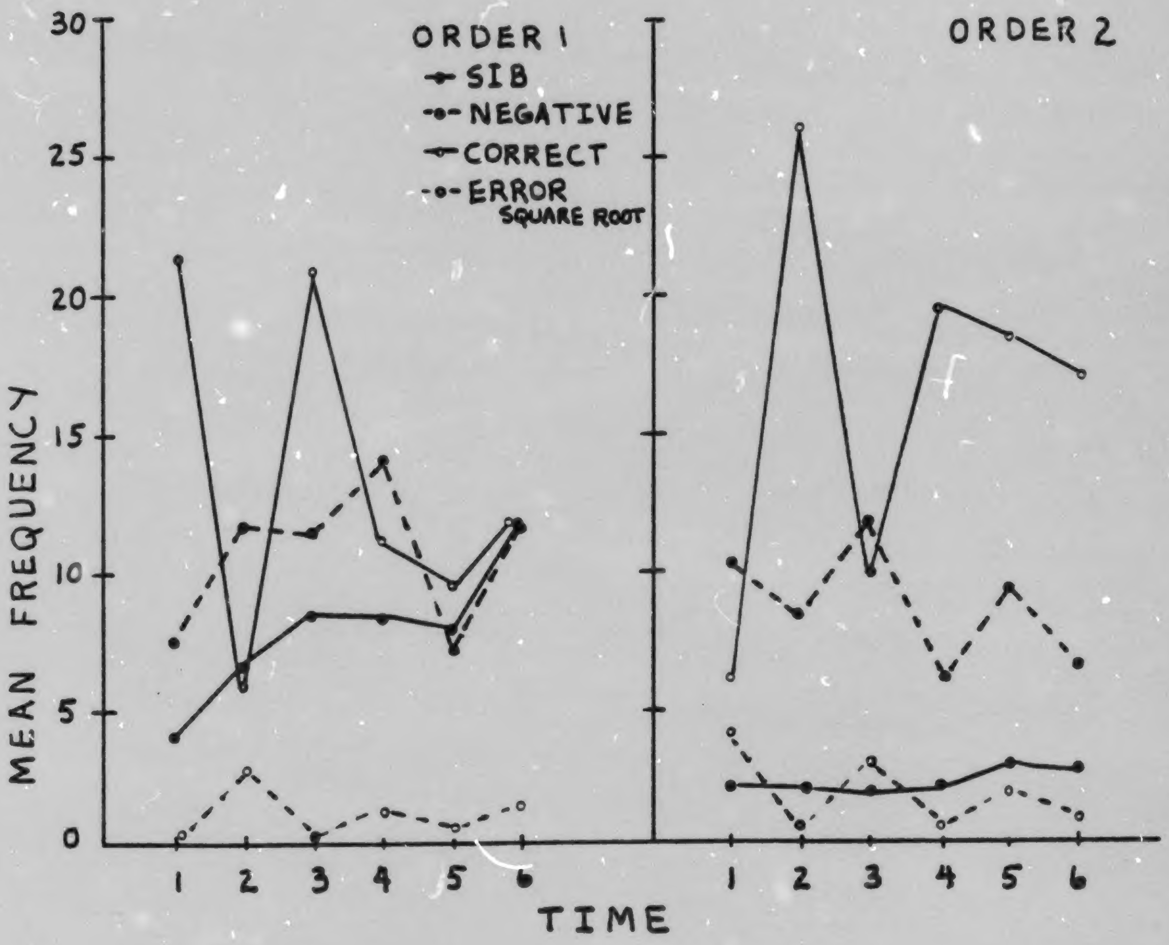

Figure 16. Patterns of Behaviors by Order During Standard Activities.

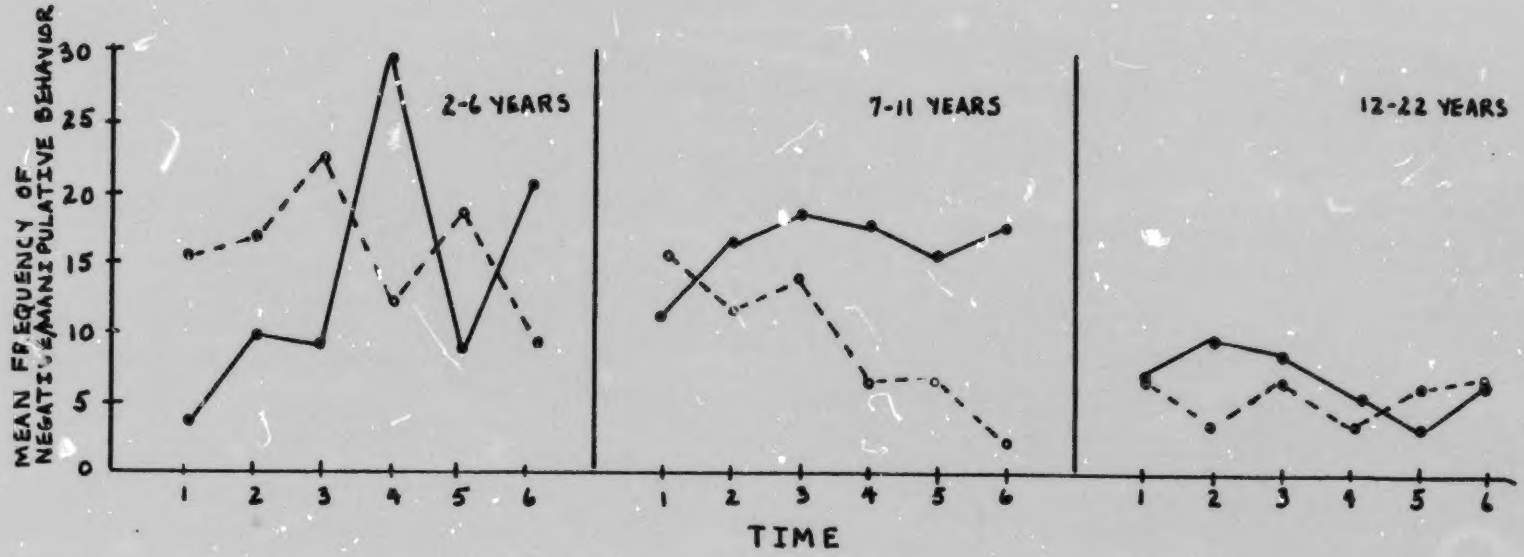

Figure 17. Age x Time x Order Interaction Patterns of Negative/Manipulative Behavior During Standard Activities.

Order differences. Although children had been randomly assigned to the two orders, Order 1 children tended to engage in more SIB at each time period than did Order 2 children (see Figure 14). To determine the source of this difference, teacher ratings for lowest and highest frequencies of SIB per hour were compared for the two orders. The obtained mean scores demonstrated initial inequalities between the groups; i.e., mean lowest frequencies were 12.6 (S.D.=25.4) for Order 1 and 3.2 (S.D.=6.3) for Order 2, and mean highest frequencies were 120.7 (S.D.=236.4) and 95.5 (S.D.=204.1), respectively. Inspection of individual data revealed that six of the eight highest rate children (observed in Part IV) had been assigned to Order 1. When scores for highest rate children were deleted, mean teacher ratings for the two orders were virtually identical (mean lowest frequency=3.9 and 3.4 for Orders 1 and 2, and mean highest frequency=56.5 and 55.6, respectively).

Within order patterns. Although findings generally confirmed experimental hypotheses, the actual levels of SIB and negative behavior were relatively high across time periods, and neither behavior decreased when the easy task was reintroduced in Order 1. To identify contributing factors, individual subject data were investigated for the easy-difficult tasks within each order. Four response patterns of SIB and negative/manipulative behavior combined were noted: 1) the expected pattern; 2) increased maladaptive behavior over time; 3) decreased maladaptive behavior over time; and 4) a reversal pattern (high SIB during the easy task and low SIB during the difficult task). The mean frequencies of maladaptive behavior by pattern and order are listed in Table 48.

Table 48

Mean Frequencies of Maladaptive and Adaptive Behaviors by Subgroup and Order

Subgroup and Behavior	Order 1						Order 2					
	E1		D1		E2		D1		E1		D2	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Expected												
Negative	7.1	(12.9)	11.4	(16.1)	3.5	(6.4)	18.3	(20.2)	8.9	(15.0)	16.4	(19.0)
Error	0.4	(0.7)	13.9	(18.3)	0.3	(0.5)	19.5	(16.7)	0.7	(1.3)	19.1	(15.7)
Correct	23.9	(11.0)	7.6	(5.0)	25.9	(12.8)	5.8	(2.8)	17.5	(9.8)	9.1	(9.8)
Increase												
Negative	5.9	(6.8)	21.5	(16.0)	27.0	(15.6)	6.1	(8.7)	11.9	(9.9)	15.7	(11.9)
Error	0.4	(1.0)	9.0	(8.5)	1.2	(2.0)	17.0	(11.5)	0.9	(1.2)	13.1	(12.7)
Correct	19.6	(9.6)	3.6	(3.1)	17.8	(10.1)	7.1	(8.1)	22.6	(20.0)	13.7	(22.3)
Decrease												
Negative	21.0	(19.2)	17.0	(20.0)	12.7	(16.3)	4.8	(4.1)	2.7	(2.7)	1.5	(3.2)
Error	2.7	(0.6)	21.0	(2.6)	2.0	(3.5)	21.3	(9.2)	0.8	(0.4)	20.3	(10.2)
Correct	35.7	(14.1)	9.0	(6.2)	36.0	(16.7)	4.8	(2.6)	27.7	(8.2)	7.8	(7.0)
Reversal												
Negative	20.3	(9.1)	12.3	(9.3)	26.7	(16.0)	23.0	(25.5)	29.5	(19.1)	16.0	(11.3)
Error	0.0	(0.0)	8.3	(10.4)	0.0	(0.0)	11.5	(9.2)	0.0	(0.0)	11.0	(0.0)
Correct	24.7	(8.7)	7.7	(5.9)	21.7	(8.3)	8.5	(0.7)	16.5	(6.4)	11.5	(3.5)

Eight children in Order 1 and 10 children in Order 2 exhibited the expected pattern of maladaptive behavior. In addition, their error and correct responding covaried as hypothesized.

Virtually all of the highest rate SIBers within Order 1 and most of the 2-6 year olds in both orders engaged in increasing SIB across tasks, resulting in a total of nine Order 1 and seven Order 2 children showing this pattern. Since these children also showed the expected pattern of correct and error responses, they may have been reacting to either the re-presentation of the first task or the demands for continued work. A subgroup of the Order 1 children also exhibited low response rates across all three conditions. Teachers of these children did not seem to know how to make the tasks easier (to enable successful performance) or how to control the maladaptive behaviors effectively.

The decrease over time and reversal patterns were least common (decrease by three Order 1 and six Order 2 children, and reversal by three Order 1 and two Order 2 children). Although the decrease group exhibited the expected correct and response alternations, they also exhibited higher total responses than the increased maladaptives group; e.g., twice as many (and over one standard deviation above the mean) for Order 1 and slightly more for Order 2. Among children exhibiting the reversal pattern, no error responses occurred during the easy task, but correct and error responses were equal for the difficult task.

In sum, although slight variations in correct and error frequencies were emitted by the subgroups, the general patterns remained as expected. It would seem that events other than task performance must influence these children's maladaptive behavior.

Task Preferences

An ancillary question of interest is what tasks do SIBers perceive as preferred or nonpreferred? A first source of information is the teacher's perception of task preference. The actual tasks chosen by teachers are listed in Appendix O. Among all 48 SIBers, educational tasks were chosen for 66%, prevocational tasks for 14%, gross motor activities for 10%, music for 6%, and snack for 2% of the preferred activities. For nonpreferred activities, educational and prevocational tasks were chosen equally (42% and 44%), and other types of activities were selected infrequently. Analysis of the prevocational tasks alone indicates that 76% of these tasks were nonpreferred. A reasonable conclusion would be that prevocational tasks in use with SIBers are largely aversive to these children.

A second source of information relative to task preference is the child's reaction to the chosen tasks. That some teachers misjudge children's task preferences is evident from reversal patterns (higher maladaptive behavior during preferred and less maladaptive behavior during nonpreferred tasks) exhibited by at least one-fifth of the children.

SIB Parameters and Associated Characteristics

Whereas previous sections centered on teacher's perceptions of SIB parameters and associated characteristics, the present section is concerned with the actual behaviors emitted by SIBers and observed during standard activities. The information collected by these two methods is also compared and contrasted.

Frequency of SIB. In general, the same patterns of SIB frequency reported by teachers were obtained from the standard activities. As reported on the questionnaire, SIB frequency per 30 minutes was considerably higher among 7-11 (mean=39.6, S.D.=48.0) and 12-22 year olds (mean=32.0, S.D.=49.1) than among 2-6 year olds (mean=13.3, S.D.=16.6). Also consistent with teacher reports, the upper limits of SIB increased at each successive age level (2-6 year range=0-48; 7-11 year range=0-129; and 12-22 year range=0-188). And, finally, the mean difference between lowest and highest SIB, based on time intervals with lowest and highest frequencies, increased with age (2-6 years, mean=7.9, S.D.=8.5; 7-11 years, mean=12.3, S.D.=14.7; and 12-22 years, mean=14.7, S.D.=27.1 per 5 minutes).

Despite these apparent similarities, comparison of individuals' reported and observed frequencies (standard activity score multiplied times two to yield one hour) indicates that teachers tend to underestimate the frequency of SIB. Specifically, 23 children's extrapolated frequencies fell within the range estimated by the teacher (lowest to highest SIB per hour); 17 children engaged in higher frequencies of SIB than reported on the questionnaire (mean difference=+45.7, S.D.=47.7, range=1-145); and only three children exhibited lower frequencies of SIB (mean difference=-4.67, S.D.=4.7, range=1-10). A one between-one within MANOVA for age x method confirmed the existence of significant differences between methods for both SIB frequency and number of topographies ($F[2,38]=22.50$, $p < .001$).

Topography of SIB. Whereas observed frequency of SIB was higher than that reported by teachers, the opposite results were obtained for number of general topographies. Specifically, 14 children exhibited the same number of topographies as reported by teachers, 30 children exhibited fewer (mean difference=-1.9, S.D.=1.1), and 2 children engaged in more topographies (mean=+1.0, S.D.=0.0).

The average number of general topographies observed was 1.7 for the overall group (S.D.=1.3), 1.1 for 2-6 year olds (S.D.=1.0), 1.8 for 7-11 year olds (S.D.=1.8), and 1.7 for 12-22 year olds (S.D.=1.1). Within the youngest group, almost one-third of the children exhibited zero SIB and only 18% engaged in two or more topographies. In marked contrast, 50% or more of children in the older group exhibited two or more topographies. In addition, 50% of the 7-11 year olds, 33% of the 12-22 year olds, and 18% of the 2-6 year olds had three or more topographies. The restricted number of topographies observed as compared to the number reported by teachers (mean=3.0, S.D.=1.4 for high rate group), may reflect the limited time period of observation as well as the alternation of stressful and non-stressful tasks.

Of the 10 general topographies, self-biting, face hitting, and head-banging were present equally among 2-6 year olds, followed by "other SIB." Within the older groups, biting self and face hitting were exhibited by the greatest number of children, followed by head banging for the 7-11 year olds and other SIB among the 12-22 year olds. However, the age groups could not be differentiated by the presence or absence of individual topographies (nonsignificant discriminant analysis). Table 49 outlines the distribution of topographies across age groups.

Although the total number of different topographies engaged in by children was less than that reported by teachers, the observed frequencies of each topography did correspond to questionnaire rankings of most to least frequent (Spearman r=0.39-0.71, $\underline{p}<.01-.0001$ for HB, BS, FH, HP, DS, KH, and OF; nonsignificant for SB). This finding confirms the accuracy of teachers' perceptions of individuals' hierarchies of SIB topographies.

Self-restraint. Self-restraint behaviors were exhibited by the two children who previously were reported to engage in object related SIB. The remaining seven children reported by teachers did not engage in self-restraint and were not prompted to do so by teachers.

Table 49

Percent of Children Exhibiting Each SIB Topography During Standard Activities

General Topography	Age Group		
	2-6 years	7-11 years	12-22 years
HB	36	40	29
BS	36	70	46
FH	27	60	44
HP	0	20	6
DS	0	0	2
KH	0	0	2
OF	9	10	4
KS	0	0	0
SB	18	30	29
EP	0	0	0

Note. HB=headbanging; BS=biting self; FH=face hitting; HP=hair pulling; DS=digging/scratching self; KS=knee to head hitting; OF=object to face hitting; KS=kicking self; EP=eye poking; SB=other SIB.

Negative/manipulative behaviors. As noted earlier, negative behaviors other than SIB were over twice as frequent among 2-6 year olds than among 12-22 year olds (mean frequency per 30 minutes for 2-6 year olds=87.0, S.D.=63.1; for 7-11 year olds=80.7, S.D.=66.3; and for 12-22 year olds=36.3, S.D.=33.0). However, the hierarchy of negative/manipulative behaviors outlined in Table 50 remained constant across age groups. Behaviors from most to least frequent were negative vocalizations (mean for all SIBers=31.1 per 30 minutes), negative motor-gestural behaviors (mean=18.7), negative actions on objects (mean=8.6), negative physical contact (mean=1.3), and negative speech (mean=0.8).

The number of children exhibiting each type of negative/manipulative behavior parallels findings for frequency of all behaviors combined, i.e., proportionately fewer children within the 12-22 year old group exhibited each negative behavior than in the younger groups. In addition, the two older groups are distinguished by the more frequent presence of negative physical contact among 7-11 year olds (partial $F[2,42]=4.85$, $p<.01$). The complete discriminant equation for age group assignment=1.46404(NG) - 0.56495(NA) + 2.10568(NP) - 0.28099(NV) + 0.55927(NSP) - 1.2572.[1]

Social/communication behaviors. Child social/communicative behavior occurred only slightly less frequently than self-injurious behavior (mean per 30 minutes=24.7, S.D.=23.6). Except for the youngest group, simpler social/communication behaviors (sensori-motor stages III and IV) were most frequent (overall mean=6.9), followed by behaviors coordinating

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[1] NG=negative motor-gestural behavior; NA=negative action on object; NP=negative physical contact; NV=negative vocalization, and NSP=negative speech.

Table 50

Mean Frequencies of Child Behaviors During Standard Activities

Child Behavior	Age Group		
	2-6	7-11	12-22
Self-Injurious			
HB	1.6	10.8	6.5
BS	7.5	4.5	1.6
FH	3.0	11.5	14.5
HP	0.0	7.9	0.1
DS	0.0	0.0	0.9
KH	0.0	0.0	0.1
OF	0.2	0.4	0.0
KS	0.0	0.0	0.0
EP	0.0	0.0	0.0
SB	0.8	4.5	6.9
TH	0.1	0.0	1.4
Negative/ Manipulative			
NG	23.8	29.1	12.5
NA	10.3	17.2	4.4
NP	0.2	2.2	0.7
NV	51.0	30.3	18.5
NSP	0.0	1.8	0.2
Social/Communicative			
SO	1.4	3.7	1.3
SA	0.8	1.9	0.2
CO	2.2	0.3	0.6
CP	1.2	3.1	2.9
TR	0.1	0.0	1.4
CA	8.3	2.7	5.4
CR	0.7	0.2	2.7
VO	2.3	5.2	3.4
Symbolic			
SN	0.0	0.0	1.4
BR	0.1	0.7	0.0
IS	2.3	5.3	5.7
IR	0.3	1.2	0.1
SP	1.6	1.5	0.9
Watch	21.3	10.0	19.0
No Response & Ignore	8.3	5.8	10.2
Self-Stimulatory	6.0	14.1	12.7
Play	12.5	3.9	4.3

persons and objects (Stages V and VI, mean=5.5), referential gestures (mean=1.7), vocalization (mean=3.5), speech (mean=6.6), and signing (mean= 0.8) (see Table 50).

Social/communicative behaviors were also more frequent during familiar, teacher chosen activities than during project-designed tasks (significant linear contrast for time, $\underline{F}[1,36]=14.22$, $\underline{p} < .0006$).

Other child behaviors. The next most frequent behavior exhibited by SIBers was "watching." In fact, watch, combined with no response and ignore, occurred as frequently as errors. However, nonresponding (no response plus ignore) was higher when attempted compliance was lower (r with correct = -0.32, $\underline{p} < .03$; r with error =-0.33, $\underline{p} < .02$), whereas this pattern was not obtained for watch.

Self-stimulatory behaviors occurred at a low rate of 0.4 per minute (overall mean=11.4 per 30 minutes, S.D.=14.5). A significant quintic time x order interaction ($\underline{F}[1,36]=4.73$, $\underline{p} < .04$) was produced primarily by the relationship of self-stimulatory behavior with task preference; i.e., higher during the preferred task and lower on the nonpreferred task. Self-stimulatory behavior was also twice as frequent among 7-11 and 12-22 year olds, whereas play behaviors were three times as frequent among 2-6 year olds (see Table 50).

Interrelationship among child behaviors. The frequency of SIB correlated positively with number of SIB topographies ($r=0.64$, $\underline{p} < .0001$), but was unrelated to any other measures. Frequency of negative/manipulative behavior was related similarly to number of negative behavior topographies ($r=0.44$, $\underline{p} < .002$), but also correlated negatively with both correct and error frequencies ($r=-0.50$, $\underline{p} < .0003$, and $r=-0.49$, $\underline{p} < .0004$ respectively). In contrast, social/communication behaviors were associated with more frequent error responses ($r=0.32$, $p < .03$). In addition, both number of SIB and number of negative/manipulative topographies covaried inversely with error frequency ($r=-0.33$, $p < .02$, and $r=-0.44$, $p < .002$).

A tentative set of conclusions can be drawn from the pattern of correlations and the children's performance on the standard activities. First, children who are SIBers do attempt to comply with task demands, whether by correct or error responding, and such compliance increases with age (and probably with improved adaptive behavior and cognitive skills). Second, as errors increase, children initially attempt to deal with this situation by engaging in positive social/communication behaviors. Third, when correct and error responding decreases or ceases, negative/manipulatives and nonresponding increase. Also, children who continue to attempt to comply with task demands despite higher error frequency exhibit fewer SIB and negative/manipulative behavior topographies. Fourth, as SIB frequency increases, watching behavior decreases. Fifth, SIB and negative/manipulative topographies seem to comprise two separate response classes; that is, topographies within the same set are intercorrelated but are unrelated to topographies within the opposite behavioral set. And, finally, no direct relationship was obtained between SIB and correct or error responding frequencies. Factors which influence SIB remain to be identified through analyses of adult behaviors and antecedents to SIB.

Adult behaviors. Adult behaviors from most to least frequent per 30 minutes were positive speech (mean=163.1), followed by visual directives (mean=95.42), physical contact and prompts (mean=88.0), praise (mean=36.4), and negative behaviors (mean=11.7). Among verbal behaviors, behavior requests were by far the most frequent, with information statements occurring about half as often and information requests one-third as often. Of visual directives, forms of visual task presentation were three times more frequent than gestural cues, and gestural cues were equally likely to accompany behavior requests ($r=0.40$, $\underline{p} < .005$) or visual task presentations ($r=0.36$, $\underline{p} < .01$).

Of physical contact behaviors, physical prompting was more frequent, followed by physical contact and then tactile task presentation. Among negative behaviors, negative physical contact was most frequent, followed by negative actions on objects (taking an unoffered object), restraint, and negative speech. Both physical prompts and negative physical contact were positively associated with higher SIB frequency ($r=0.45$, $\underline{p} < .001$; $r=0.59$, $\underline{p} < .0001$), and physical contact and negative action on object with number of SIB topographies ($r=0.40$, $\underline{p} < .005$; $r=0.34$, $\underline{p} < .02$). Since physical contact was often a quasi form of restraint, it would appear that as body parts were held the children shifted to other SIB topographies.

Similarly, children's frequency of negative/manipulative behavior was associated with physical contact and tactile task presentation ($r=0.42$, $\underline{p} < .003$; $r=0.46$, $\underline{p} < .0009$); and number of negative/manipulative topographies increased with frequency of tactile task presentation, negative behavior requests by adult, and restraint behavior ($r=0.31$, $\underline{p} < .03$; $r=0.42$, $\underline{p} < .003$; $r=0.41$, $\underline{p} < .004$). Physical punishment was also more likely with increased self-restraint behavior ($r=0.78$, $\underline{p} < .0001$).

Higher correct and error responding were associated with more frequent visual task presentation strategies ($r=0.56$, $\underline{p} < .0001$; $r=0.39$, $\underline{p} < .007$), but were negatively related to all forms of physical and tactile contact ($r=-0.33$ to -0.58, $\underline{p} < .02$ to $.0001$). Consistent with instructions for the difficult task, higher error frequencies correlated positively with information statements by adult (e.g., "No, that's not right;" ($r=0.36$, $\underline{p} < .01$).

Interestingly, praise was unrelated to any task performance by the child, but increased relative to behavior requests by adult ($r=0.31$, $p<.03$); that is, the more often the adults emitted behavior requests, the more likely they were to administer verbal or physical praise, regardless of the child's task performance. When frequencies of task performance and praise are compared, it is evident that praise occurred an average of one-third as often as correct responses and one-fourth as often as attempted compliance (errors). And, finally, as noted in the parent-child interaction literature, behavior requests by adults did not lead to social/communication behavior by the child, whereas both information statements and information requests were associated with child nonverbal and verbal communication (information statement, $r=0.34$, $p<.02$; information requests such as "What do you want?" $r=0.45$, $p<.002$).

Taken together, these findings may be viewed in two ways: 1) that visual prompts are more effective with this group of SIBers than are physical contact behaviors; or 2) that adults increase physical contact as a means of obtaining compliance when children's responding decreases and negative behaviors increase. If both of these conclusions are true, a vicious cycle could develop as follows: A teacher who is less effective in gaining the child's interest and cooperation could precipitate non-response and negative behavior, treat the resultant noncompliance with increasing physical contact and negative strategies, and in turn generate further negative behavior and escalation of SIB and negative/manipulative topographies.

Interrelationship of child behaviors and the ABS. Relationships among ABS domains and actual behaviors observed were investigated through canonical correlation of selected domains with behaviors and inspection of Pearson correlations. For ABS Part I, raw scores on independent functioning, language development, and socialization domains were compared with SIB, negative/manipulative behavior, social/communication, and correct response frequencies. The obtained, significant canonical variate ($F[12,90.247]=4.70$, $p<.0001$) primarily reflects the relationship between independent functioning and correct responses, with the former accounting for 58% of the variance among standard activity behaviors and the latter for 62% of the variance among ABS domains. (See Table 51 for standardized canonical coefficients and squared correlations.)

Furthermore, the observed frequency of correct responding correlated positively with every ABS Part I domain ($r=0.40$ to 0.76, $p<.01$ to $.0001$), and error frequency was moderately related to independent fucntioning and physical development ($r=0.47$, $p<.0002$; $r=0.36$, $p<.03$). Scores on language development also are moderately sensitive predictors of actual frequency of social/communicative behavior ($r=0.33$, $p<.04$). Conversely, children with more frequent negative/manipulative behaviors were perceived to engage in fewer independent functioning, language development, and socialization skills ($r=-0.42$, $p<.006$; $r=-0.41$, $p<.007$; and $r=-0.33$, $p<.03$). Although SIB frequency is unrelated to Part I domains, the number of SIB topographies tends to be higher among children with lower physical development ($r=-0.42$, $p<.007$) and language development ($r=-0.31$, $p<.05$). And frequency of self-restraint behavior correlated moderately with scores on physical development, self-direction, and socialization domains ($r=0.32$, $p<.04$; $r=0.39$, $p<.02$; and $r=0.38$, $p<.02$).

No significant canonical variates were obtained for standard activity behaviors (SIB, negative/manipulative, and self-stimulatory frequencies) with ABS Part II domains (violent and destructive, rebellious, withdrawal,

Table 51

Canonical Correlation for ABS Adaptive Behavior Domains With Standard Activity Behaviors

Variable	Standardized Canonical Coefficient	Squared Correlation with Canonical Variate
Criterion Set[a]		
SIB	-0.0990	0.01
NM	-0.0963	0.22
SC	-0.0332	0.01
COR	0.9388	0.62
Predictor Set[b]		
IF	0.79415	0.58
LD	0.303	0.33
SOC	0.216	0.20

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[a] SIB=self-injurious behavior; NM=negative/manipulative behavior; SC=social/communication; COR=correct response.

[b] IF=independent functioning; LD=language development; SOC=socialization.

stereotyped, and eccentric behavior). Similarly, observed behaviors generally were uncorrelated with ABS Part II domains. Exceptions include a negative relationship between SIB frequency and number of SIB topographies with the rebellious behavior domain ($r=-0.34$, $p<.03$; $r=-0.32$, $p<.05$). This finding is consistent with previous results of higher decile standing of 2-6 year olds on the rebellious behavior domain as well as the pattern of decreasing negative/manipulative and increasing SIB at successive age levels. Additional expected relationships were frequency of self-stimulatory behavior with the stereotyped behavior domain ($r=0.44$, $p<.004$) and frequency of social/communication with scores for unacceptable vocal habits (due to items concerning echolalic speech, $r=0.43$, $p<.006$).

Interrelationship of child behaviors and cognitive assessment. Observed child behaviors were found to be significantly related to cognitive functioning levels. First, frequency of correct responses was significantly related to average mental age of all SIBers combined (partial $F[1,29]=42.38$, $p<.0001$) and accounted for 48% of the variance in the obtained multiple regression equation ($F[4,29]=14.96$, $p<.0001$]: $MA=-0.0744(SIB) + 0.0669(NM) - 0.0024(SC) + 0.3131(COR)$.[1]

In addition, 77% of the variance between sensori-motor subscale mental ages and observed behaviors can be accounted for by a significant canonical variate ($F[20,54.016]=3.15$, $p<.0004$) in which object permanence, causality, and schemes are related positively to social/communication and correct responses and negatively with SIB and negative/manipulative frequencies (see Table 52).

Similar to relationships obtained with adaptive behavior, correct and error responding is correlated positively with performance on all subscales

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[1] NM=negative/manipulative; SC=social/communicative; COR=correct behavior.

Table 52

Canonical Correlation for Sensori-Motor Subscale Mental Ages with Standard Activity Behaviors

Variable	Standardized Canonical Coefficient	Squared Correlation with Canonical Variate
Criterion Set[a]		
SIB	-0.3238	0.67
NM	-0.4145	0.54
SC	0.4612	0.40
COR	0.3477	0.32
Predictor Set[b]		
OP	0.7717	0.52
ME	-0.3694	0.28
CAUS	0.2289	0.36
SR	-0.5436	0.24
SCH	0.8622	0.56

---

[a] SIB=self-injurious behavior; NM=negative/manipulative; SC=social/communication; COR=correct response.

[b] OP=object permanence; ME=means-end; CAUS=causality; SR=spatial relations; SCH=object schemes.

(significant for raw scores, mental ages, and stage placements, $r=0.40$ to 0.96, $p < .05$ to $.0001$). Higher negative/manipulative behavior frequency is associated with lower functioning on all subscales ($r=-0.39$ to -0.98, $p < .04$ to $.0008$) as are number of SIB and number of negative/manipulative topographies ($r=-0.41$ to -0.69, $p < .02$ to $.0001$). And children with higher performances on all subscales except means-end and gestural imitation engaged in more watching behavior (of adult and task materials, $r=0.37$ to 0.98, $p < .05$ to $.004$), whereas self-restrainers exhibited higher means-end behaviors ($r=0.52$, $p < .005$).

Immediate Antecedents to SIB

Antecedent behaviors. Immediate antecedents to SIB were defined as behaviors within the behavioral act or turn preceding an SIB. Not included were turns comprising additional SIB or behaviors co-occurring with SIB. Only those behaviors which preceded SIB at least once were included in analyses. When two behaviors occurred within the antecedent turn, each behavior was counted separately.

The 25 adult and 23 child behaviors identified as immediate antecedents to SIB were proportional to their absolute occurrence within the 30 minutes of activity. Verbal and nonverbal behavior requests by adult preceded SIB for half the children (behavior requests=46% of children and totalled 174 occurrences; visual task presentation=46% and 134; information statement=46% and 116; information requests=31% and 41; and gestural cues=25% of children and 30 occurrences). Forms of physical contact constituted antecedents to SIB for one-third of the children (physical prompts=38% and 71; physical contact=35% and 55; and tactile/kinesthetic contact=17% of children and 61 occurrences). Among child behaviors, negative/manipulative behaviors preceded SIB for the greatest number of children (negative vocalization=38% and 48; negative motor-gestural=25% and 19), but task performance occurred most frequently (correct performance=29% and 74; discrete child behavior=17% and 23; approximation=10% and 13; and error=13% of children and 9 occurrences).

At first glance, the infrequent occurrence of errors antecedent to SIB is surprising. However, research on task difficulty actually identified teacher corrections of errors (included here in verbal and nonverbal behavior requests) and errors within a 10 second interval (akin to an antecedent condition effect) as preceding SIB (Gaylord-Ross et al., 1980; Weeks, 1981).

Cluster analysis. In order to avoid a singular matrix (equal variables and subjects), child and adult antecedents to SIB were cluster analyzed separately, yielding eight child and seven adult clusters (Varclus, SAS, 1981). These, in turn, were submitted to a second-order cluster analysis which accounted for 77% of the variance in the measures and generated four major antecedent classes and four groupings idiosyncratic to one or a few SIDers. (Second-order and first-order clusters along with constituent behaviors are listed in Table 53.)

The most frequently occurring antecedent cluster (#1) reflects adult verbal and nonverbal behavior requests, child task performance and task avoidance behaviors, and self-restraint. Cluster 2, although infrequent, reflects most extreme avoidance escalation, i.e., verbal and physical aggression by the child and negative speech by the adult. Cluster 3, second most frequent, comprises adult physical and tactile contact and moderate negative actions by the child. Third most frequent is Cluster 5, containing primarily child self-stimulatory behavior and adult gestural cues. Least frequent were Clusters 4, 6, 7, and 8. Of these Clusters 4 and 8

Table 53

Cluster Analysis of Antecedents to SIB during Standard Activities

Second Order Clusters	Percent[a]	Frequency[b]
Cluster 1	(77%)	(655+)
Variable 1 - Child	(48%)	(140+)
Negative motor-gestural	25%	19
Comply correct	29%	74
Approximation	10%	13
Error	13%	9
Discrete behavior	17%	23
Ignore	2%	1
No response	2%	1
Walk		
Variable 3 - Child	(4%)	
Initiate self-restraint	4%	
Terminate self-restraint	4%	
Variable 9 - Adult	(69%)	(515)
Negative physical contact	4%	39
Behavior request	46%	174
Information statement	46%	116
Visual task presentation	46%	134
Praise	38%	49
Terminate restraint	6%	3
Cluster 2	(10%)	(10)
Variable 5 - Child	(10%)	(7)
Negative physical contact	8%	4
Negative speech	4%	3
Variable 12 - Adult	(2%)	(3)
Negative behavior request	2%	3
Cluster 3	(67%)	(321)
Variable 2 - Child	(29%)	(56)
Negative action on object	10%	7
Negative vocalization	29%	48
Play	2%	1
Variable 11 - Adult	(54%)	(148)
Physical prompt	38%	71
Take unoffered object	13%	15
Information request	31%	41
Negative information statement	2%	1
Sign	8%	9
Apply restraint	8%	11
Variable 15 - Adult	(35%)	(117)
Physical contact	35%	55
Tactile task presentation	17%	61
Ignore	2%	1
Cluster 4		
Variable 8 - Child	(6%)	(3)
Watch	6%	3
Variable 10 - Adult	(2%)	(3)
Adult-peer interaction	2%	1
Approach	2%	1
Walk	2%	1
Cluster 5	(25%)	(38)
Variable 4 - Child	(6%)	(4)
Coordinated communication	2%	1
Self-stimulatory behavior	6%	3
Variable 14 - Adult	(21%)	(34)
Referential gesture	21%	30
Leave	2%	1
Auditory task presentation	4%	3
Cluster 6		
Variable 7 - child	(2%)	(2)
Independent work	2%	2
Cluster 7		
Variable 6 - Child	(2%)	(1)
Primary needs behavior	2%	1
Cluster 8		
Variable 13 - Adult	(4%)	(3)
Auditory environmental stimuli	2%	1
Watch	4%	2

Note. Clusters=second-order clusters; variables=first-order clusters; behaviors=observational codes.

[a] Percent=percent of children with each antecedent.

[b] Frequency=total frequency of antecedent for all children combined.

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reflect visual and auditory stimuli, respectively, not directed to the child; and Clusters 6 and 7 contain infrequent independent work and eating behaviors.

These classes of antecedents to SIB obtained during standard activities are similar but not identical to those generated by the Antecedent/Consequent Card Sort. First, the range of antecedents tapped by the standard activities is considerably more restricted than that obtained from the card sort. Second, standard activity clusters subsume multiple card sort clusters. For example, Cluster 1 of the standard activity antecedents comprises the card sort clusters of Presentation of and Reaction to Mands, Appropriate Behavior, and Self-Restraint. Conversely, behaviors from the Avoidance Escalation cluster on the card sort were split between a similar avoidance cluster and the physical contact cluster for the standard activities. Differences in clusters obtained by the two methods may be attributed to the more restricted activity conditions inherent in the planned activities.

Antecedent, age, and cognitive differences. Scores obtained by weighting actual frequencies with cluster scoring coefficients were utilized for all analyses. In addition, the arcsine of proportion square roots was employed for analysis of variance.

A one between-one within ANOVA for age group x antecedent clusters yielded a significant main effect for clusters ($\underline{F}[7,228]=35.46$, $\underline{p} < .0001$), but not for age or the interaction term. Cluster differences were due to the more frequent occurrence of both Cluster 1 task presentation and related behaviors and Cluster 3 physical/tactile contact and related reactions (mean scores for SIBers=1.20 and 0.89 respectively), as compared to remaining antecedent clusters; Duncan's post hoc analyses, $\underline{p} < .05$.

These two clusters also were related significantly to total SIB frequency during the 30 minutes of activities; Cluster 1, partial $\underline{F}(1,34)=8.17$, $\underline{p}<.0001$, $R^2=0.60$; Cluster 3, partial $\underline{F}(1,24)=4.31$, $\underline{p}<.05$, $R^2=0.13$. Additionally, the obtained multiple regression equation ($\underline{F}[8,34]=8.17$, $\underline{p}<.0001$) indicates that children who engaged in SIB following Cluster 4 visual stimuli and Cluster 6 independent work tended to exhibit lower SIB frequencies across time: Total SIB Frequency=3.46 (Cluster 1) - 3.15 (Cluster 2) + 6.66 (Cluster 3) - 11.42 (Cluster 4) + 13.19 (Cluster 5) - 1.23 (Cluster 6) + 50.73 (Cluster 7) + 2.43 (Cluster 8).

As depicted in Figure 18, the three age groups generated similar profiles of antecedents. Consistent with total SIB frequencies, 7-11 year olds exhibited the most elevated scores, and 2-6 year olds had the lowest scores on antecedent clusters. The same pattern was maintained for number of different first- and second-order clusters (see Table 54).

The number of antecedents to SIB also is related to cognitive functioning level. As can be seen in Figure 19, number of first- and second-order clusters is highest among sensori-motor Stage III children, declines throughout the remainder of the sensori-motor and beginning preoperational periods, and again increases among highest functioning children. This pattern suggests that, with increasing cognitive abilities, children respond more selectively to stimulus cues for SIB. Although the reason for increased number of antecedents to SIB within the 4 to 7 year mental age group is unclear, the finding is consistent with the increased SIB frequency and number of topographies reported by teachers.

Individual Profiles. As obtained with the Antecedent/Consequent Card Sort, profiles of antecedent clusters differed among children (see Figure 20). In addition, children obtained similar scores on the same second-order

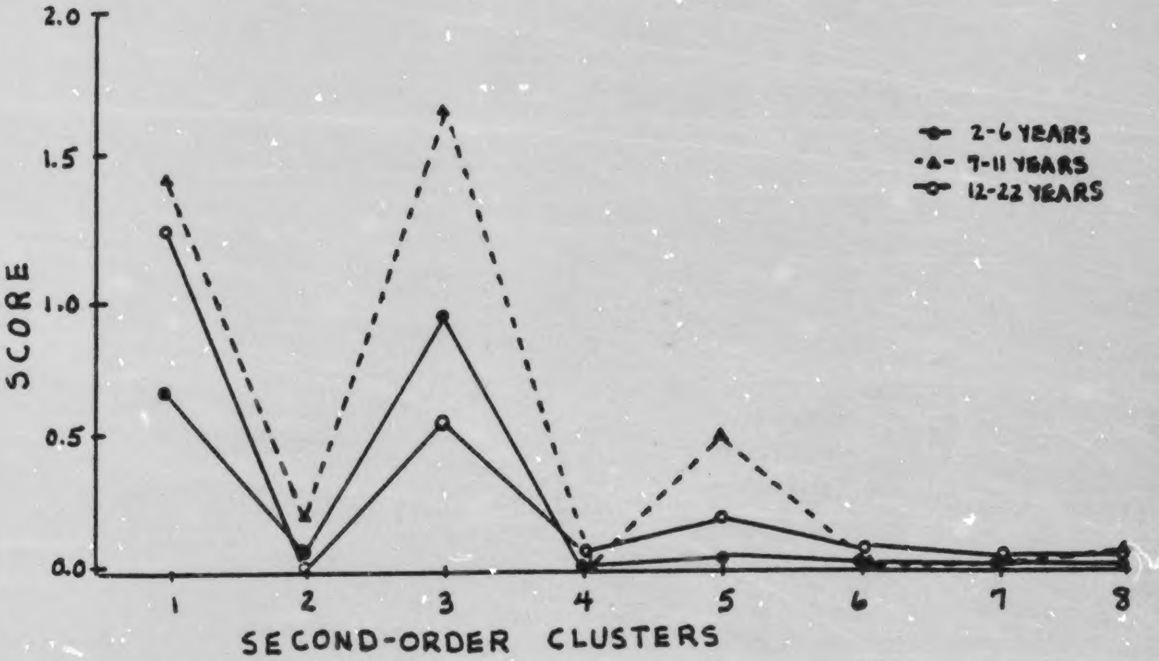


Figure 18. Mean Scores by Age Group for Second Order Clusters of Antecedents to SIB.

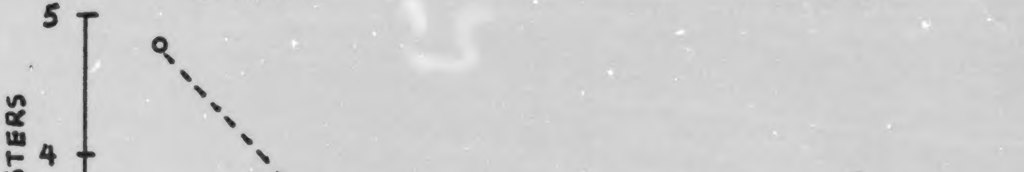


Figure 19. Mean Number of Clusters of Antecedents to SIB by Sensori-Motor Stage Placement and Preoperational Mental Age Equivalent.

Table 54

Number of First- and Second-Order Clusters of Antecedents to SIB by Age Group and Highest Rate Group

	Age Group					
	2-6 years		7-11 years		12-22 years	
Rate Group and Clusters	Mean	S.D.	Mean	S.D.	Mean	S.D.
All SIBers						
Second-Order Clusters	1.5	(1.2)	2.3	(1.2)	2.0	(1.1)
First-Order Clusters	2.4	(2.1)	4.1	(2.1)	3.0	(1.9)
Highest Rate SIBers						
Second-Order Clusters	2.0	(0.0)	2.3	(1.2)	3.0	(3.0)
First-Order Clusters	4.5	(0.7)	5.7	(0.6)	5.0	(1.0)

clusters by engaging in SIB following different first-order antecedents. For example, within Cluster 1, 21 children exhibited SIB following both adult behavior requests and their own task behavior, 10 responded only to adult behaviors, two preceded SIB with their own behavior only, and two engaged in SIB following self-restraint as well as adult request and task behaviors.

As might be expected, mean scores of highest rate SIBers exceeded the average scores for their age groups and for the group as a whole (see Figure 20). Similar results for number of different antecedents are listed in Table 54.

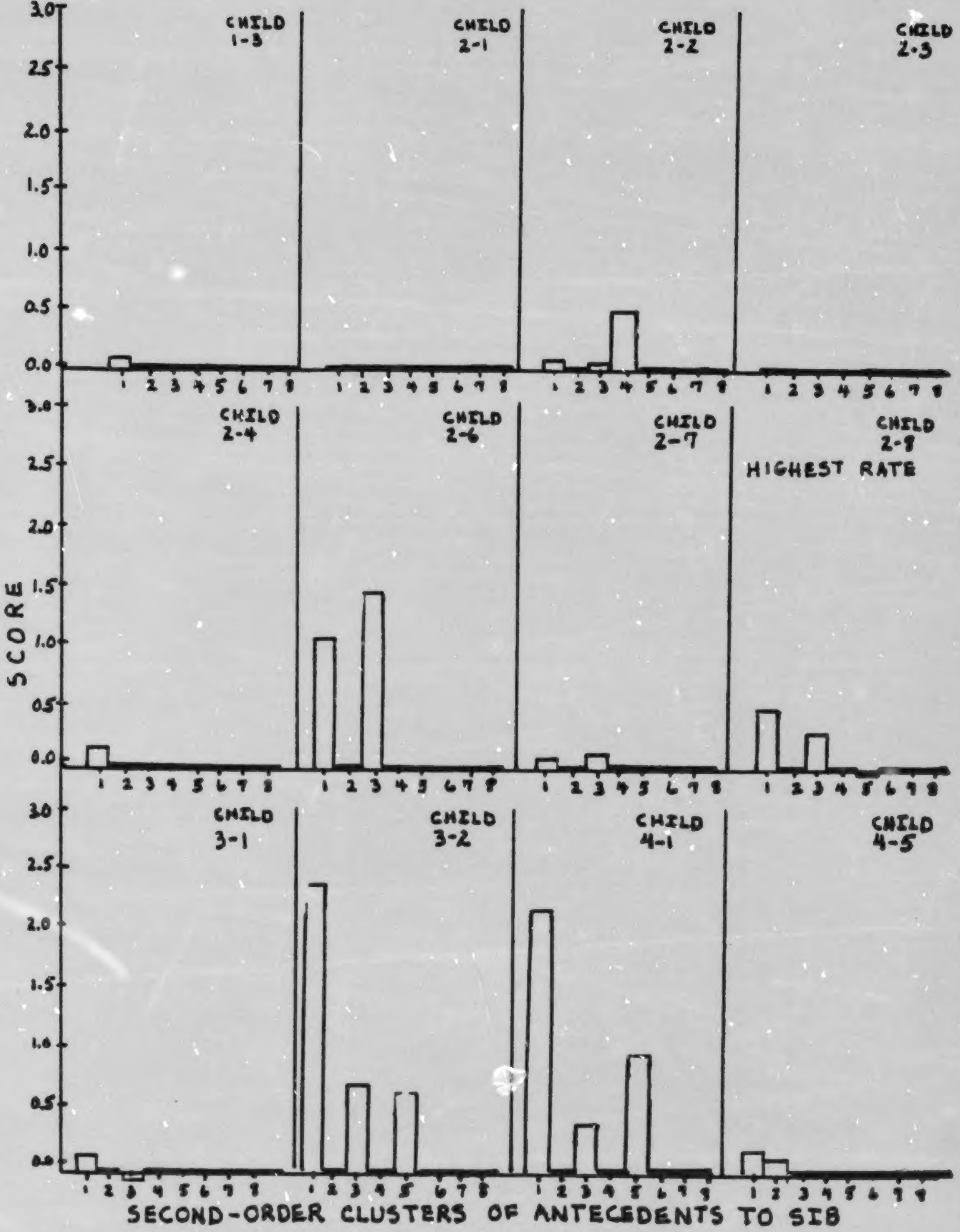


Figure 20. Individual Profiles of Second-Order Clusters of Antecedents to SIB.

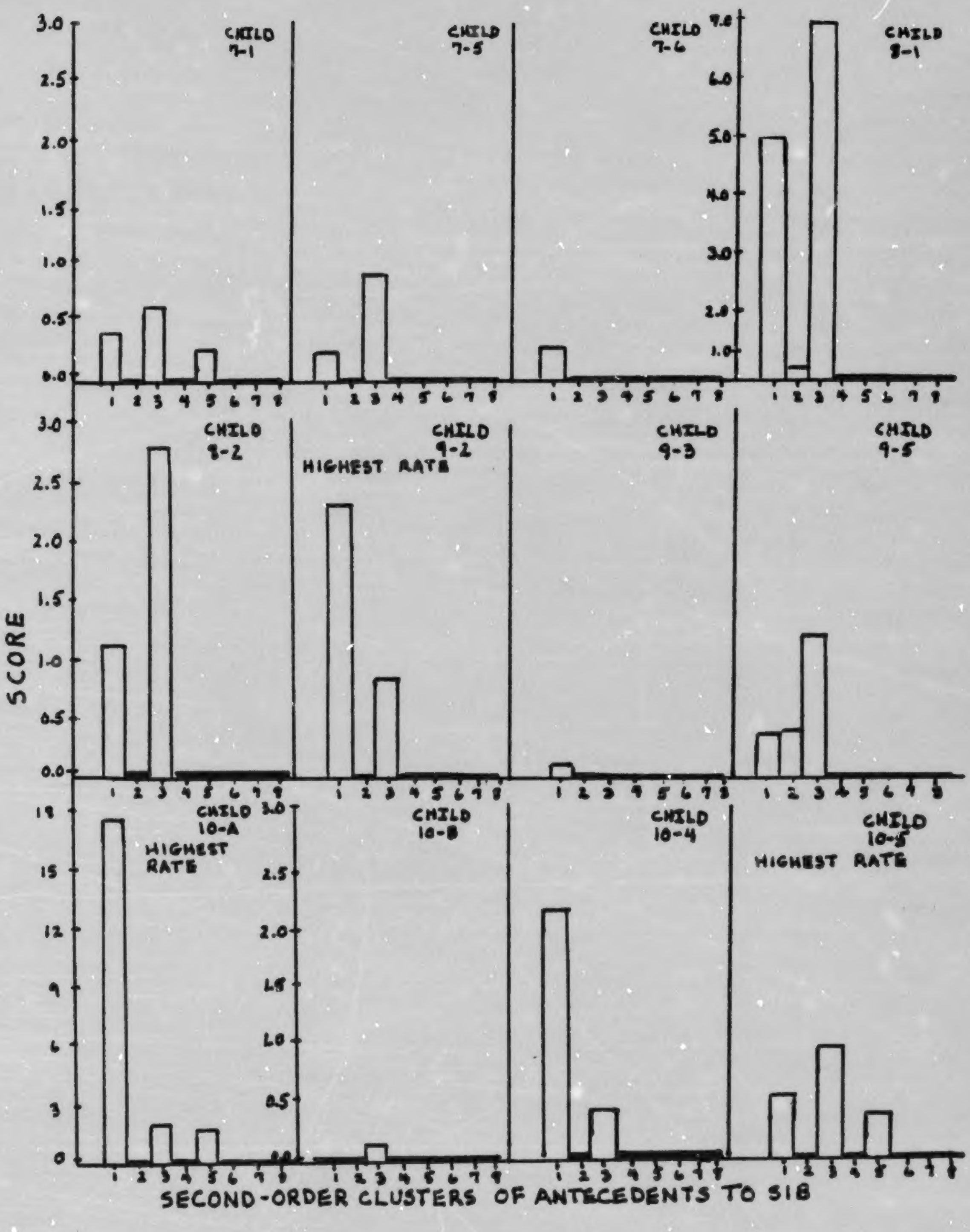
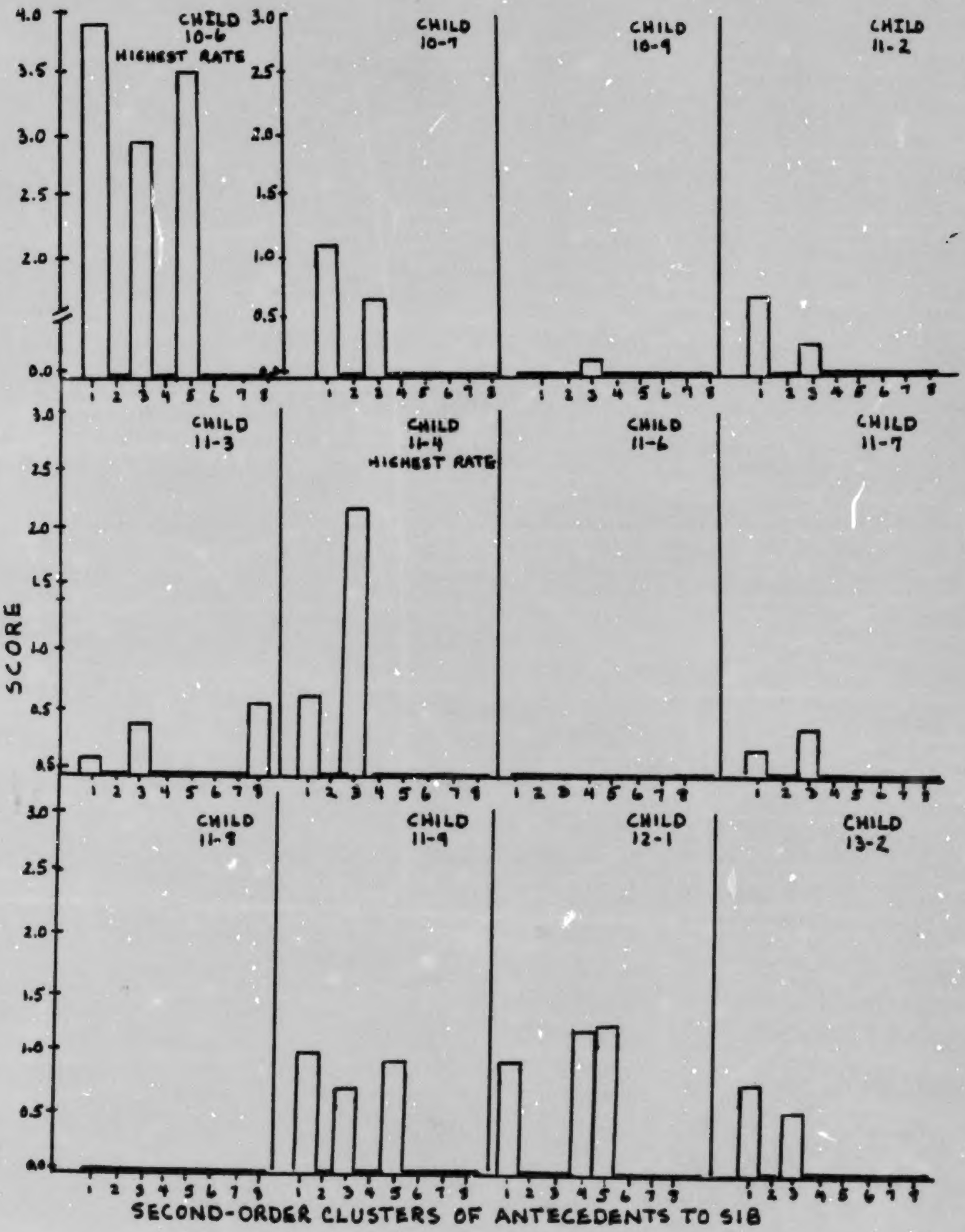


Figure 20 (continued).



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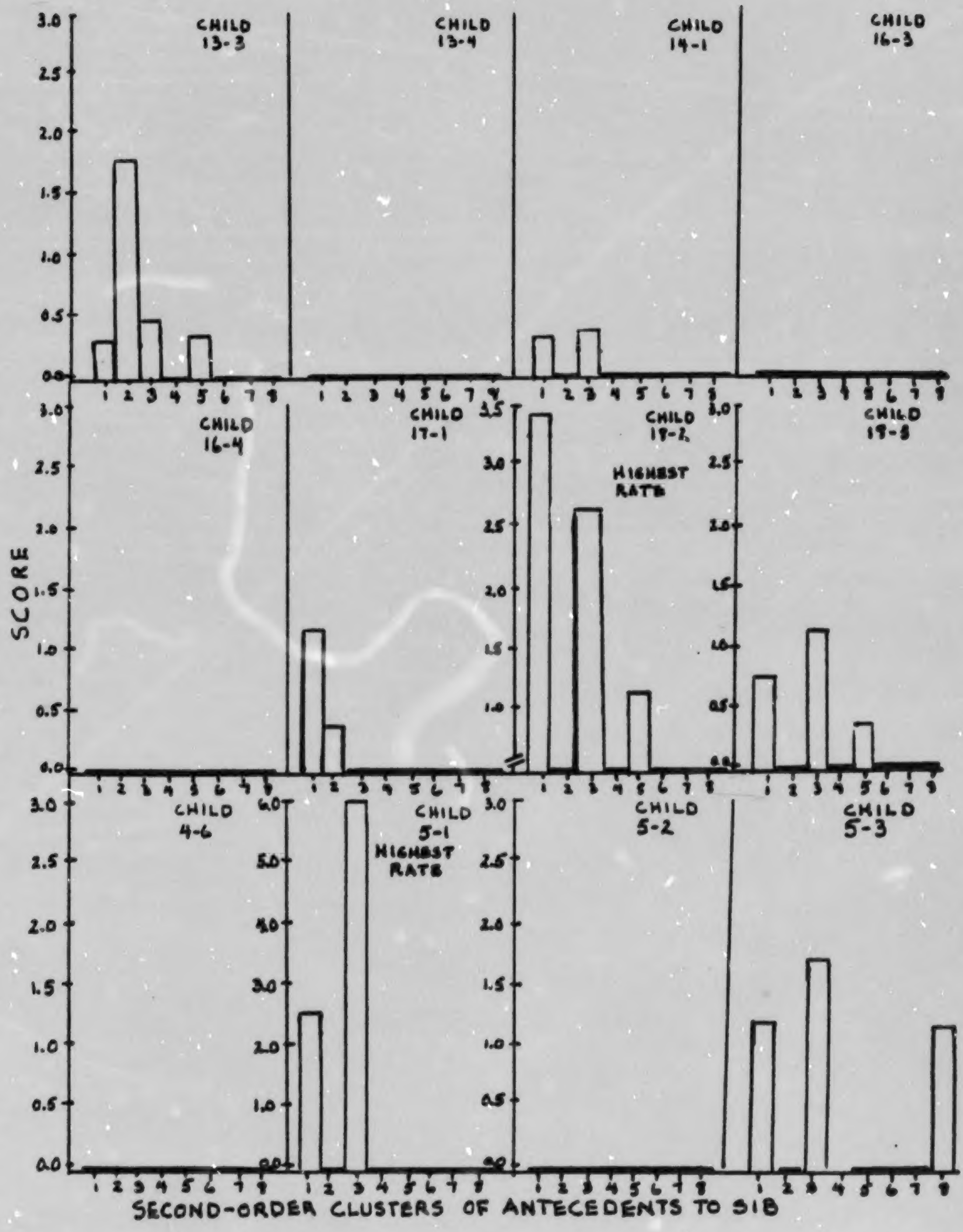

Figure 20 (continued).

Part IV: Naturalistic Observation

Parameters of SIB

Frequency of SIB. Average frequencies of SIB per hour, as shown in Table 55, ranged from 18.4 up to 717.3 SIB per child. These frequencies were equal to or higher than both extrapolated frequencies from standard activities and highest frequencies per hour reported by teachers. Children's highest hourly frequencies also exceeded the average highest frequencies reported by teachers for the high rate group at each age level, thus confirming the selection of these children as among the most severe within their respective age groups.

Age differences in SIB frequency reported by teachers and obtained from standard activities were observed during naturalistic observations as well. Specifically, average SIB per hour increased from 20.3 for 2-6 year olds (S.D.=2.6) to 93.9 for 7-11 year olds (S.D.=46.8) to a high of 469.4 for 12-22 year olds (S.D.=240.3).

As depicted in Figure 21, the frequency of each child's SIB was variable both within and across days. The conditions and events influencing this variability are discussed in subsequent sections.

Topography of SIB. The mean number of different topographies per child (mean=4.8, S.D.=1.9, range=2 to 8) also was equal to or greater than the number reported by teachers or observed during standard activities. Among age groups, the 7-11 year olds exhibited the greatest number of topographies, a finding consistent with teacher perceptions (mean number of topographies for 2-7 years olds=4.0, S.D.=0.0; for 7-11 year olds=6.7, S.D.=1.5; and for 12-22 year olds=3.7, S.D.=2.1).

As can be seen in Table 56, each child engaged in a subset of topographies frequently and exhibited additional topographies relatively

Table 55

Parameters of SIB during Naturalistic Observations

	SIBers							
SIB Frequency	5-1	9-2	11-4	10-6	18-2	10-5	10-A	2-8
Mean per hour	22.1	18.4	115.4	126.2	40.1	453.3	237.5	717.3
Lowest per hour	7	0	58	62	23	7	5	121
Highest per hour	44	70	211	256	77	149	228	2358

Table 56

Distribution of SIB Topographies by Child during Naturalistic Observation

	SIBers							
SIB Topographies	5-1	9-2	11-4	10-6	18-2	10-5	10-A	2-8
Head bang	3%	41%	44%	1%	74%	-	.4%	97%
Bite self	52%	56%	26%	1%	4%	-	2%	2%
Face hit	44%	1%	9%	61%	19%	93%	85%	.6%
Hair pull	-	-	-	10%	-	-	1%	-
Dig/scratch	-	-	-	.1%	-	-	-	-
Knee to head	-	-	2%	.4%	.3%	-	.3%	-
Object to face	-	-	9%	2%	-	-	-	-
Kick self	-	-	-	-	-	-	-	-
Eye poke	-	-	.03%	-	-	-	-	-
Other	2%	1%	10%	21%	3%	7%	.03%	-
(SIB threat)	-	-	(1%)	(2%)	-	.2%	(11%)	(.02%)

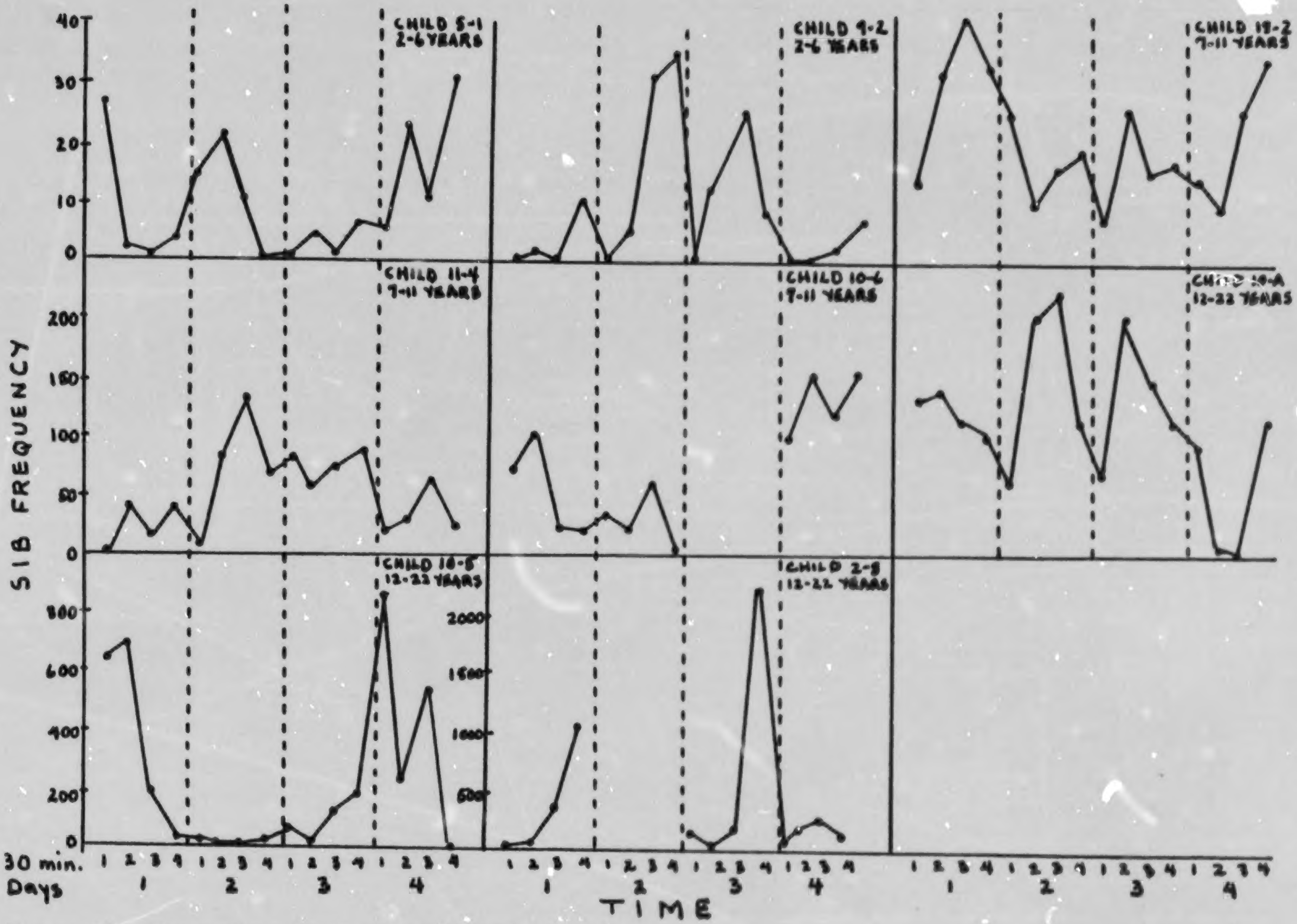

Figure 21. Frequency of SIB across Days by Child.

infrequently. The infrequently occurring topographies easily could have gone unnoticed by teachers and would not have been encountered during the limited time period for standard activities. Despite these underestimates, observed frequencies of major SIB topographies corresponded to hierarchies reported by teachers on the questionnaire (Spearman r=-0.85 to -1.00, *p* .007 to .000 for HB, BS, FH, HP, and SB) and recorded during standard activities (r=0.76 to 0.98, *p* .03 to .0001 for HB, BS, HP, and SB).

The interrelationship of lower and higher probability topographies varied among children and are diagrammed in Figures 22-25. For child 10-5, topography changes followed the stochastic probability model; i.e., as the highest probability topography of skull slapping decreased, other milder SIB of tapping chest or chin temporarily increased. The opposite pattern was exhibited by child 10-A, who resorted to head banging and, finally, arm or shirt biting at the heighth of SIB escalation. Activity and adaptive equipment influenced topography expression for children 9-2 and 18-2. Specifically, child 9-2 shifted from self-biting to head banging when physically restrained for the former and exhibited self-biting during vestibular and exercise activities incompatible with head banging. And, finally, child 18-2 engaged in headbanging only when in the wheelchair and never when on the floor or in other adaptive equipment.

Antecedents to SIB

Antecedent condition effects. The effects of antecedent conditions on SIB were most obvious for children 10-A and 18-2. As in standard activities, 10-A's SIB was zero during self-restraint and frequent when out of restraint. Child 18-2 escalated both SIB and negative/manipulative behaviors both

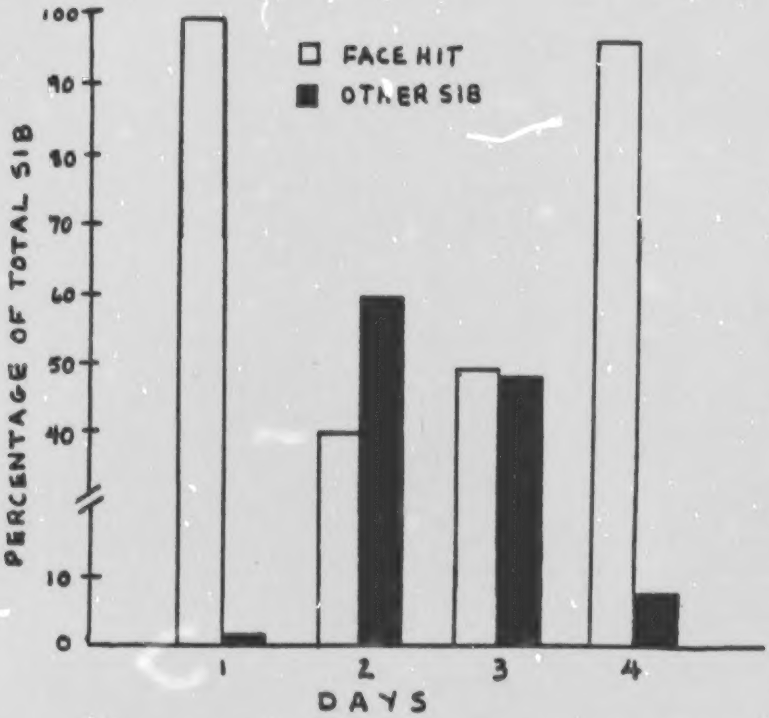

Figure 22. Increase in Other SIB with Decrease in Face Hitting by Child 10-6.

DL GP ED PV GM MU SN [✓ BA] TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: Wash hands PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.
1		
1CC - 3BR - 1CC -	3BR - 1FH - 3NP - 1CC -	1FH-3NP-1FH-3NP-1FH-3NP-1BS-3NB
CA	CB	
DL GP ED [✓ PV] GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: Washers PC RA RS	Task: PC RA RS	Task: PC RA RS
on stick T.O.	T.O.	T.O.
2		
3BR-1FH-3NP-1FH-3NP-1FH-3NP	3BR - 1FH - 3NP - 3NI_	1BS - 3NP - 3BR - 1FH - 3NP
	VT NB	VT
DL GP ED PV GM MU SN BA [✓ TB] OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: Leave PC RA RS	Task: PC RA RS	Task: PC RA RS
Self-restraint T.O.	T.O.	T.O.
3		
2CR - 2TA - 1FH - 2NP -	2IR - 1FH - 2NP - 1FH - 2NP	2BR - 1FH - 2NP - 1FH - 2NP - 1BS
BR		
DL [✓ GP] ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: Vision specialist, track light PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.
4		
3CR - 1NV - 1TH - 3NP - 1FH -	3NP-1FH-3NP-1FH-3NP-1FH-3NP-1FH-3NP	- 1RS - 3NB - 1FH - 3NP - 1BS
BR		NP

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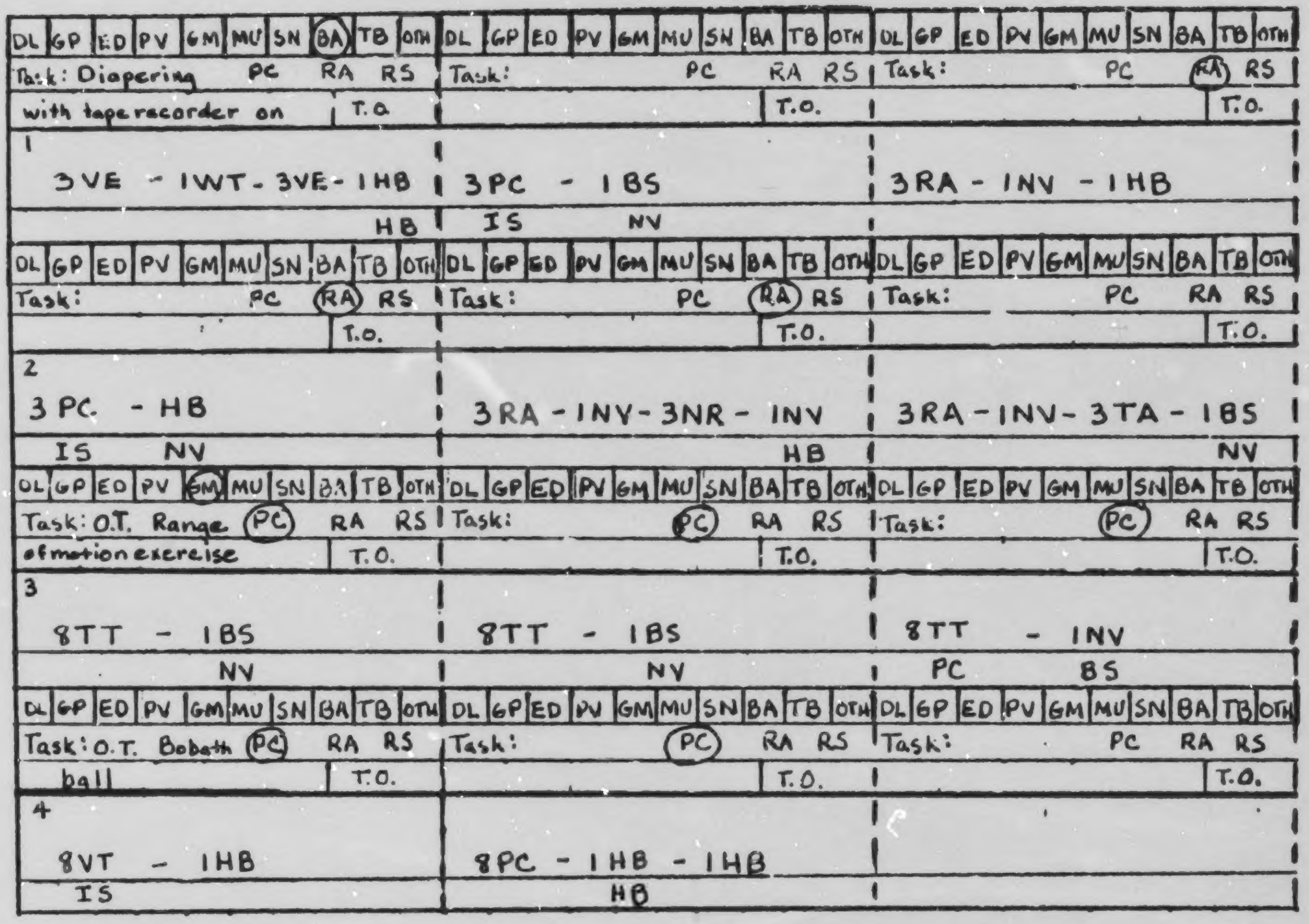
Figure 23. Changes in Topography with Escalation of SIB by Child 10-A.



DL GP ED PV GM MU SN [✓ BA] TB OTH Task: Diapering PC RA RS with tape recorder on T.O. 1 3VE - 1WT - 3VE - 1HB HB	DL GP ED PV GM MU SN BA TB OTH Task: PC RA RS T.O. 3PC - 1BS IS NV	DL GP ED PV GM MU SN BA TB OTH Task: PC [✓ RA] RS T.O. 3RA - 1NV - 1HB
DL GP ED PV GM MU SN BA TB OTH Task: PC [✓ RA] RS T.O. 2 3PC - HB IS NV	DL GP ED PV GM MU SN BA TB OTH Task: PC [✓ RA] RS T.O. 3RA - 1NV - 3NR - INV HB	DL GP ED PV GM MU SN BA TB OTH Task: PC RA RS T.O. 3RA - 1NV - 3TA - 1BS NV
DL GP ED PV [✓ GM] MU SN BA TB OTH Task: O.T. Range [✓ PC] RA RS of motion exercise T.O. 3 8TT - 1BS NV	DL GP ED PV GM MU SN BA TB OTH Task: [✓ PC] RA RS T.O. 8TT - 1BS NV	DL GP ED PV GM MU SN BA TB OTH Task: [✓ PC] RA RS T.O. 8TT - 1NV PC BS
DL GP ED PV GM MU SN BA TB OTH Task: O.T. Bobath [✓ PC] RA RS ball T.O. 4 8VT - 1HB IS	DL GP ED PV GM MU SN BA TB OTH Task: [✓ PC] RA RS T.O. 8PC - 1HB - 1HB HB	DL GP ED PV GM MU SN BA TB OTH Task: PC RA RS T.O.

Figure 24. Relationship of SIB Topography with Physical Contact, Physical Restraint, and Occupational Therapy Exercises for Child 9-2.

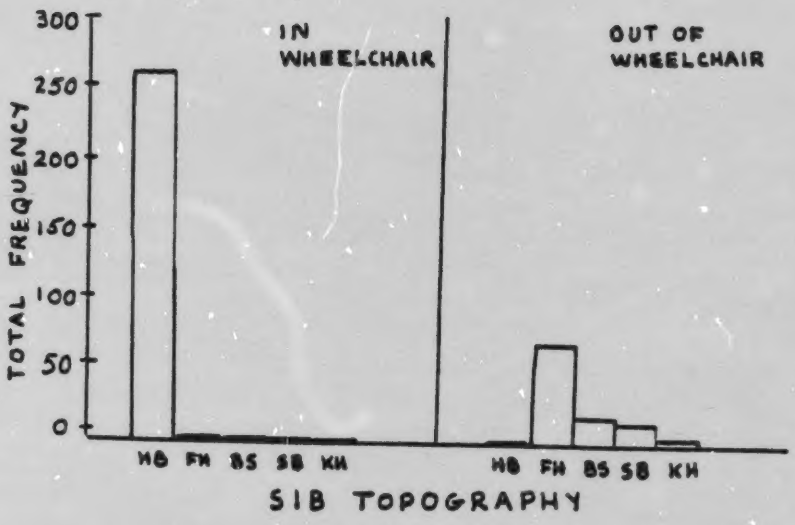


Figure 25. Frequency of SIB Topographies by Child 18-2 during Time In and Out of Wheelchair.

within and across days while being fed a pureed lunch and abruptly ceased SIB when presented with a preferred milkshake drink.

Immediate antecedents to SIB. Children exhibited idiosyncratic patterns of stimuli antecedent to SIB (see Table 57). Although antecedents noted during standard activities also preceded child 10-6's SIB in the classroom, visual environmental stimuli not directed to the child assumed a more central role in the latter setting. This child also engaged in SIB prior to or after reaching for desired materials. The profile obtained from the Antecedent/Consequent Card Sort (Figure 9) more aptly depicts the varied influences of behavior requests, physical contact, and appropriate behavior on the child's SIB in the classroom than does the antecedent profile obtained for the standard activities (Figure 20).

Typical of young children's SIB as observed in this study, child 9-2's SIB was highly variable, including prolonged periods of zero SIB. SIB invariably occurred relative to a favorite object, the tape recorder; e.g., while observing adult carrying recorder, when prevented from playing with the recorder, etc. SIB also occurred following a series of negative/manipulative behaviors which were precipitated by unsuccessful attempts to activate toys or difficulties encountered in ambulation.

Less obvious was the role of self-restraint in child 10-A's SIB. Figure 26 illustrates the comparatively lower frequencies of SIB during spring 1982 when no self-restraint was allowed versus fall 1982 when tasks were alternated with 10 minute periods of self-restraint (headphones, fingers in belt loops, plus fuzz between fingers). It should be noted that the same intervention (sharply bringing arm down), tasks, and task sequences were employed at both time periods. In addition, programmed

Table 57

Immediate Antecedents to SIB During Naturalistic Observations for Children 9-2, 10-6, and 2-8

Child and Antecedents	Percent
Child 9-2	
Forms of physical contact	40%
Negative/manipulative behaviors	27%
Self-injurious behaviors	15%
Difficulties in play and ambulation	4%
Environmental stimuli not directed to child	4%
Adult speech	3%
Adult take away unoffered object	2%
Adult physical prompts	1%
Accidential tactile/kinesthetic contact	1%
Adult terminate physical restraint	1%
Adult leave	1%

Table 57 (continued)

Child and Antecedents	Percent
Child 10-6	
Visual and auditory stimuli not directed to child	(38%)
Visual and auditory environmental stimuli	16%
Adult approach	3%
Adult leave	9%
Adult-peer interaction	7%
Child watch	3%
Verbal and nonverbal task presentation and mands	(25%)
Task presentation	9%
Physical prompt	3%
Adult speech	12%
Adult stop spectacle	2%
Physical contact and praise	(14%)
Physical contact	10%
Physical contact - sign	1%
Physical contact - praise	1%
Verbal praise	2%
Child behavior	(21%)
Discrete child actions and play	9%
Unoccupied and self-stimulatory	5%
Correct and approximate task performance	3%
Negative/manipulative behaviors	4%
Adult no response to communication and SIB	(4%)

Table 57 (continued)

Child and Antecedents	Percent
Child 2-8	
During Tasks	(100%)
Adult behavior	(87%)
Physical contact and prompts	36%
Negative physical contact	18%
Leave or no response	13%
Tactile/kinesthetic contact	9%
Physical praise	7%
Physical sign	2%
Move table	2%
Child behavior	(13%)
Task performance	11%
Nonverbal communication	2%
During free time	(100%)
Actions by peers	15%
Adult approach	1%
Child watch adult/peer	5%
Child negative vocalization	52%
Child self-stimulatory behavior	25%
Child walk	1%

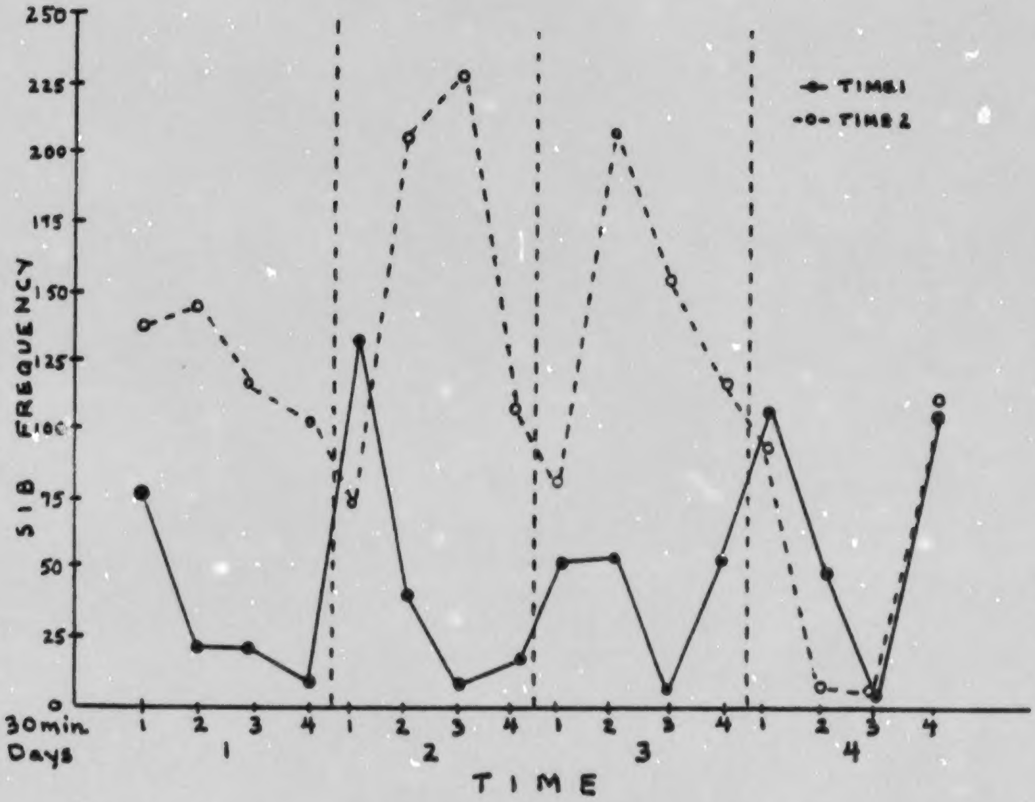


Figure 26. Frequency of SIB Across Days by Child 10-A at Time 1 Without Self-Restraint and at Time 2 With Programmed Self-Restraint.

self-restraint was made contingent on no SIB and signing during the second time period. Despite these precautions, minor forms of self-restraint were virtually continuous during out of restraint time, including self-restraint by holding objects. At first glance, the distribution of antecedents to SIB appears to be primarily mand related. However, visual and verbal requests to perform tasks were, in effect, requests to relinquish materials and, therefore, to cease self-restraint. Similarly the child's own actions preceding SIB were forms of picking up or letting go of objects; i.e., forms of initiating and terminating self-restraint.

The interaction of blindness and SIB is evident in the case of child 11-4. Stimuli that invariably precipitated SIB included strong or unexpected tactile and physical contact as well as unexpected or loud sounds. These types of stimuli often arose when adults interacted with the child without advance warning. Similarly, SIB occurred when adults removed objects or left the child without warning; i.e., child would reach for object or adult, find nothing in the expected location, and would engage in SIB.

Antecedent/Consequent Relationships

Negative reinforcement. Whereas most children in the study exhibited multiple functions of SIB, child 5-1's SIB almost exclusively conformed to an avoidance pattern with a dense schedule of negative reinforcement. SIB was observed following virtually every adult contact either alone or in conjunction with other negative behaviors, such as attempts to move away from adult or adult presented materials. Adults almost invariably terminated contact following these behaviors, thus negatively reinforcing SIB. In contrast, SIB rarely occurred during free time in the absence of adult intrusion.

Accidental reinforcement of environmental stimuli. SIBs that were preceded by environmental stimuli were noted to be followed by additional, accidental events. For both child 10-6 and child 18-2, SIB preceded by watching adults move in directions away from the child often was followed immediately by the adult moving in the child's direction. In general, the adult had not noticed the SIB and may not have been directing either the leave or approach behaviors to the child. Sudden sounds not directed to the child also were observed to cease following SIB; e.g., a blender turned off, a dropped object sounding briefly only, etc.

Shaping adult antecedent behaviors. SIB in response to successively briefer adult behaviors was evident with child 10-6. For 10-6, a 10-second attention withdrawal, followed by requesting alternative behavior, was utilized. On certain occasions a repetitive sequence developed in which SIB first followed adult contact or approach behaviors. After several adult behavior-SIB-10 second attention withdrawal cycles, the child would SIB as the adult began to open her mouth, made a slight movement toward the child, etc. These brief adult behaviors also were followed by longer chains of SIB. This cycle appeared to be influenced by the failure to prompt an alternative behavior which could compete with SIB immediately following initial attention withdrawal.

Imperfect Punishers and SIB

Inconsistent consequation. A water squirt consequence was administered contingent on SIB during tasks only and contingent on all SIB except head banging for child 2-8. The most obvious effect of the situation specific punishment was infrequent SIB during tasks and high frequency SIB (predominantly headbanging) during free time. More subtle effects were evident during tasks. When several hand bites were not consequated on Day 1, handbites increased while face hits remained at near zero. When one or more face hits were not consequated on Day 2, that topography increased. Similarly, head banging was never consequated and gradually increased during tasks across days.

Punishment paired with reinforcement. Azrin and Holz (1966) have noted that pairing a reinforcer with an aversive stimulus can reduce or eliminate the punishing effect of the stimulus. A similar effect was observed with self-restraint and punishment for 10-A. Here, the adult's forcefully bringing the arm down was followed by any one of several self-restraint actions, including picking fuzz off sweater, prolonged contact with an object, picking up an object, placing thumb between fingers, etc. As a result, SIB continued to occur at a high frequency throughout the observation.

Additional Child Behaviors

Negative/manipulative behaviors. The hierarchy of observed negative/manipulative behaviors by highest rate SIBers was similar to that exhibited by the high rate group during standard activities. As is evident in Table 58, aggression toward others was infrequent, and negative vocalizations were most frequent, followed by negative motor-gestural actions. Unlike the average frequencies for the high rate group, no consistent decrease in negative behaviors with increasing age was observed.

Social/communication behaviors. In contrast to negative/manipulative behavior, frequency of social/communication behavior clearly increased with age for the youngest as compared to the oldest age groups (2-6 year old mean per 30 minutes=7.5, S.D.=2.7; 7-11 year old mean=25.8, S.D.=16.9;

Table 58

Percentage of Negative/Manipulative Behaviors by Child during Naturalistic Observations

	SIBers							
Negative/Manipulative Behaviors	5-1	9-2	11-4	10-6	18-2	10-5	10-A	2-8
Motor/gestural	38%	9%	34%	14%	47%	14%	32%	46%
Action on object	2%	13%	8%	24%	20%	4%	1%	2%
Physical contact	-	1%	2%	1%	3%	-	-	1%
Vocalization	60%	77%	55%	62%	30%	82%	67%	51%

and 12-22 year old mean=24.9, S.D.=16.0). The absence of a similar increase in frequency from the 7-11 to 12-22 year age range may be attributed to environmental rather than performance influences. Specifically, child 10-A's social/communicative behaviors primarily occurred when out of self-restraint (approximately 50% of each observation period). Similarly, opportunity for communication was restricted to task periods only (first hour of each morning) for child 2-8. In addition, communicative behaviors were discouraged by brief attention withdrawals during these time periods.

As noted in standard activities, simpler social/communicative behaviors were proportionately more frequent that coordinated or referential/communicative behaviors. For the group as a whole, the most frequently occurring behaviors were: complex behavior directed toward persons (mean=24.6%, S.D.=23.7%), simple behaviors directed toward objects (mean=18.6%, S.D.=13.7%), vocalization (mean=16.4%, S.D.=21.6%), signing (mean=13.6%, S.D.=23.4%), and coordinated behavior with person and objects (mean=13.4%, S.D.=8.6%).

Perhaps the most startling finding is the correspondence of sensori-motor functioning level with social/communicative performance. Consistent with Sugarman-Bell's (1978) findings with infants, SIBers functioning within sensori-motor stage III exhibited primarily simple behaviors directed toward persons and objects, and stage IV children showed an increase in complex behaviors directed toward persons and objects. Although lower level behaviors continued to be present, proportionately more coordinated communication was exhibited by stage V and VI children. And, finally, signing increased through stage V and was proportionally greatest at stage VI. Table 59 outlines the relationship between sensori-motor stage and communication for each child.

Table 59

Relationship Between Sensori-Motor Functioning Level and Proportion of Social/Communicative Behaviors

	Average Sensori-Motor Stage by Child							
	III		IV		V			VI
	(3.3)	(3.4)		(4.9)	(5.5)	(5.6)	(5.7)	(6.1)
Social/Communication Behaviors	5-1	11-4	18-2[a]	2-8	9-2	10-6	10-5	10-A
Simple	93%[b]	93%	51%	6%	54%	24%	8%	17%
Complex	9%	5%	43%	78%	29%	35%	34%	10%
Coordinated	0%[b]	2%	5%	15%	17%	25%	26%	18%
Sign	0%	0%	0%	1%	0%	14%	32%	55%

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[a] Parental permission for assessment was not obtained for child 18-2; estimated functioning level was based on behaviors exhibited during observation.

[b] Fifty-six percent of behaviors listed as simple were coded as coordinated. However, these behaviors were restricted to visually directed grasp or reach directed toward objects held at mid-line and were not higher level coordinated behaviors.

Task performance. Findings for task related behaviors during naturalistic observation corresponded to results from standard activities. First, frequency of attempted compliance in the form of correct, approximate, and error responses increased with age (mean per 30 minutes for 2-6 year olds=5.7, S.D.=5.4; for 7-11 year olds, mean=10.3, S.D.=9.9; and for 12-22 year olds, mean=28.6, S.D.=10.9). Second, correct responding was twice as frequent as attempted, but incorrect, responding (mean percentage of correct responses=67.8, S.D.=17.7; mean approximation and error percentage=32.1, S.D.=17.7). And, third, classroom activities produced less frequent task behaviors just as the preferred-nonpreferred tasks generated lower task performances than did project-designed tasks during standard activities.

Organization of Behaviors

A final area of interest is the distribution of behaviors within each child's repertoire. To determine individual hierarchies, 13 major behaviors were ranked from most to least frequent and their proportionate occurrences were calculated. The 13 behaviors were grouped according to maladaptive behavior (SIB, negative/manipulative, unoccupied or self-stimulatory, no response plus self-restraint, ignore, and seizure) and adaptive behavior (task performance, social/communication, play, watch, discrete child behavior, walk, and primary needs).

Although differing hierarchies of individual behaviors were obtained for children, maladaptive behaviors accounted for an average of 68% of total behaviors (S.D.=18.6, range=42-91%). As is evident from Table 60, all but two children exhibited a maladaptive behavior as the most frequent of all behaviors, and only three children engaged in an adaptive behavior

Table 60

Hierarchy of Behaviors Within Children's Repertoires

	SIBers							
Maladaptive and Adaptive Behaviors	5-1	9-2	11-4	10-6	18-2	10-5	10-A	2-8
Maladaptive								
Self-injurious	4	9	2	1	6	1	1	1
Negative/manipulative	2	5	3	9	2	5	7	3
Unoccupied/self-stimulatory	1	3	1	4	4	2	2	2
No response/ignore	3	4	4	5	3	7	10	6
Self-restraint	-	-	-	-	-	-	5	-
Seizure	-	-	-	-	12	-	-	-
Adaptive								
Task performance	9	7	9	2	7	6	4	4
Social/communication	7	8	6	7	1	3	8	5
Play	8	2	5	6	10	11	12	11
Discrete behavior	11	6	8	8	11	9	6	7
Watch	6	1	10	3	5	4	3	9
Walk	10	11	-	10	9	10	9	10
Eat/sleep	5	10	7	11	8	8	11	8

Note. 1=most frequent; 12=least frequent.

among the top two of their behaviors. These findings, in part, reflect the large amount of unprogrammed time during classroom observations (at least 50% of time for each child in free, waiting, toileting, or self-restraint activities).

DISCUSSION

The present research differs from past endeavors in terms of population targeted, instrumentation, content, and conceptual framework. First, the study represents the first large scale investigation of community as well as young developmentally delayed SIBers. Second, a multimethod approach was employed, including use of multiple questionnaires, assessments, and observational situations. Third, the content comprises more detailed documentation of parameters, associated characteristics, and multiple functions of SIB within and across individuals. And finally, assumptions underlying the research represent an attempt to integrate behavioral, ecological, and developmental perspectives.

SIB in the Community

Prevalence

The prevalence findings of the study dramatically dispell the preconception that SIBers reside primarily within institutional settings. Specifically, 100 children were identified who, in turn, were served directly by 12 service delivery systems, 25 schools, and 64 classrooms. These settings represented a wide range of programs and primary handicapping conditions, rather than being restricted to county programs for mental retardation and developmental disabilities. More than half the children served by these programs were high rate (more than 50 SIB per school day) and over 10% would be considered severe. In addition, virtually all children identified within rural programs were high rate or amongst the most severe within their age group.

A puzzling outcome was the small number of 7-11 year olds identified as compared to 2-6 or 12-22 year olds. It is conceivable that some of the preschoolers are not as severely retarded as the older children and will cease SIB as they become cognitively more mature and develop alternate behaviors for influencing the environment. Since the majority of children within the 7-11 year old group were high rate SIBers, those children with less frequent SIB may not have been referred by their programs or teachers. The oldest group also contained a number of children from the 1964 rubella epidemic, the viral strain of which caused more severe and widespread damage than in subsequent epidemics. And, finally, the oldest group may contain more children who have been transferred from other counties to Franklin County due to greater availability of educational and residential facilities.

The distribution by sex corresponded to incidence figures for mental retardation in general; i.e., 70% male and 30% female. Although the greater severity of SIB among females cited by others was not supported by study findings, relatively equal numbers of males and females were among the most severe SIBers. Thus, proportionately more females than males exhibited severe SIB.

Age Differences

Age differences in behavior, not investigated previously for SIBers, were evident for most measures employed. Both adaptive and cognitive skills were more advanced within the oldest as compared to younger age groups. Negative/manipulative behavior also decreased with age, as task compliance increased. However, most striking were increases in both frequency and number of topographies of SIB at successive age levels within the high rate group. Taken together, these results suggest that other negative behaviors such as avoidance and crying predominate among preschoolers. As these behaviors are controlled by school personnel, SIB becomes the primary counter control behavior used by older SIBers.

Comparison with Institutional Findings

Results of survey measures yield similar prevalence, parameters, and associated characteristics for the community SIBers as those previously reported for institutional populations. Average prevalence at 6% is just under the figures reported for many institutional facilities (7 to 8%). Percentage of high and low rate SIBers and respective average number of SIB topographies is almost identical to findings by Smeets (1971). However, findings of the more detailed categorizing system indicates that a greater number of topographies are exhibited by a higher percentage of individuals than previously reported in other studies (e.g., 51% exhibiting three or more topographies as compared to 24-33% reported by Schroeder et al., 1981).

The most frequently occurring topographies also are consistent with most survey results; i.e., face hitting, self-biting, and head banging. However, digging/scratching and eye poking were reported infrequently for community SIBers. The difference for eye poking may reflect the continued inconsistent use of the term self-injurious behavior. Forms of eye pressing that are self-stimulatory or "blindisms" were excluded from this study, but may have been termed self-injurious by other investigators.

Deficits in adaptive skills and language development reported by institutional surveys were confirmed in this study. However, findings of aggressive behavior toward others were not. Consistent with Ross' (1971) factor analytic study of the Fairview Problem Checklist, aggression toward others may characterize a subgroup of individuals who only engage in hand-biting and may be higher functioning.

Although language delays and disorders were present, communication was not absent. In fact, communicative behaviors occurred on the average as frequently as did SIB. Over one-third were simpler nonverbal acts which might be considered perlocutionary or early illocutionary nonverbal acts. Such behaviors could easily go unrecognized if one were looking for higher level communicative behavior.

Comparison With Surveys of Normal Infants and Preschoolers

SIB was present more frequently among lower functioning than higher functioning individuals. Besides confirming institutional findings, the distribution of individuals and SIB frequency by mental age corresponded to findings for normal infants, toddlers, and preschoolers. Within the normal population, SIB is most frequent between 9 and 18 months and decreases beginning about 2 years of age. Among community SIBers, the mean mental age of sensori-motor level children was 13 months, highest frequency of SIB was at Stages IV through VI (8-12, 12-18, 18-24 months), and greatest number of children were functioning at these levels.

Multiple Methods of Data Collection

Through multiple methods of data collection, it was possible to generate information concerning a broader range of behaviors and situations than would have been possible with only a single instrument or situation. In particular, the SIB Perception Questionnaire and Antecedent/Consequent Card Sort tapped more SIB topographies and revealed a broader range of antecedents to SIB than were obtained with the standard series of activities. Results of extended observations in the classroom confirmed teachers' perceptions. Therefore, the questionnaires may generate a more complete picture of the parameters and functions of SIB within a given individual more quickly than could be obtained through brief observation or unsystematic interview. However, the standard activities provided insight into a subset of the teacher's interactions with the SIBer as well as the child's responses to a subset of activities.

Although teachers (and parents) can identify SIB parameters and antecedents when presented with a structured format such as the questionnaire or card sort, they do not necessarily integrate this information to generate accurate perceptions of the pattern of events that precipitate and maintain SIB in the school or home setting. Explanations of why the child continued to engage in SIB were most often general statements and seldom included conditions, events, or behaviors maintaining SIB within the classroom. Teachers of lower functioning children also had more difficulty "reading" children's behavior and interpreting it within the environmental context, i.e., cited "no reason" for the occurrence of SIB. And, finally, teachers confused the children's abilities to control SIB with the efficacy of their own interventions, which were often inappropriate. Therefore, more extensive observation and recording of behaviors and events within the natural environment are needed to unravel what is clearly a complex behavioral phenomenon.

Antecedents, Consequents, and Covariation of Behaviors

The present study has demonstrated the presence of multiple functions of SIB both within and across individuals. Certain types of antecedent-consequent patterns were less obvious than others. These included antecedent events not directed to the child which were fortuitously reinforced, SIB which occurred to prevent anticipated although not necessarily forthcoming events, and subsequent child behaviors which served to reinforce SIB. Most complex was the analysis of self-restraint behaviors, especially when they occurred before, concurrent with, and following SIB.

A prototypic profile of classes of antecedents characterized SIBers at all age levels, although individual variations in profiles also were identified. Within standard activities, negative/manipulative behaviors and SIB topographies constituted separate response classes. During naturalistic observations, emission of particular SIB topographies was related to the hierarchical appearance of lower probability behaviors, body placement (e.g., in or out of wheelchair), type of activity, as well as body parts restrained. And, finally, several patterns of covariation of SIB with other behaviors were obtained.

Future Directions and Research

Although the present study represents a first step toward comprehensive analysis of SIB, its limitations must also be recognized. First, cross-sectional differences cannot be equated with change over time. Longitudinal studies are needed that will clarify the developmental course of SIB and associated behaviors within individuals.

Second, the study sample was restricted in terms of geographic area, program settings, and number of subjects (albeit large for SIB research). A large group of subjects is needed to enable confirmation of age differences as well as factor analysis of the variables investigated. Since settings within institutions differ considerably from those in full day programs, it would be advisable to investigate antecedents to SIB in these settings to determine whether antecedent classes and profiles are similar or dissimilar to those reported here. In addition, SIB in the home continues to be neglected. As Patterson (1979) has noted, and the few parent and teacher card sorts obtained in this study confirm, both the frequency and organization of maladaptive behaviors can differ between home and school settings.

And, third, despite the large number of younger children included in the study, findings shed little light on the conditions surrounding the onset of SIB. Without further knowledge concerning the causes of onset as well as why certain children develop SIB and others do not, it is impossible to move from intervention to prevention.

Concerns regarding the adequacy of interventions employed with SIBers have been voiced previously. However, the problem extends beyond the competency levels of given individuals. Teachers often perceived their "own" SIBer as unique and were unaware of the astonishingly large number of self-injurious children within central Ohio. In effect, SIB is a prevalent but unacknowledged community problem. Treatment of SIB requires both specialized knowledge and continual reanalysis of intervention effects and environmental influences. To expect teachers and staff in 64 different classrooms to attain and maintain these skills without support and guidance is neither realistic nor practical. Of additional concern are the parents of SIBers who are even less likely to encounter children similar to their own. A more centralized network of service and training is needed to meet the needs of not only children, but of staff and parents as well.

DISSEMINATION OF INFORMATION

Information from the study was disseminated through feedback to participants, instrumentation, presentations, and publications. Feedback to participants included psychological reports for all children receiving Part II Cognitive Assessment, consultation by teacher or parent request, and summary of SIB questionnaire results for each program.

Instruments developed and evaluated in the study that are available on request include the SIB Perception Questionnaire (with community norms, Appendix H), the short form of the Antecedent/Consequent Card Sort (with community norms, Appendix J), the Sensorimotor Assessment and Social/Communication Behavior Checklist (Appendix K), and the Coding System for Self-Injurious Behavior in the Natural Environment (Appendix M).

Presentations at the local level have included: 1) Self-injurious behavior in community population; for Franklin County Board of Mental Retardation and Developmental Disapbilities administrative, nursing, psychological, and behavior modification staff; May 4, 1982; 2) Analyzing antecedents to self-injurious behavior and small group discussion; presentation at Time Out for Behavior Modification, workshop sponsored by the Department Behavior Modification Committee, Ohio Department of Mental Retardation and Developmental Disabilities for state-wide institution personnel; May 14, 1982; 3) Ecobehavioral analysis of self-injurious behavior; presentation for Department Behavior Modification Committee; September 10, 1982; and 4) The analysis of self-injurious behavior; in-service training workshop for project participants; October 1, 1982 (see Appendix R for in-service agenda and listing of participants). At the international level, The relationship of self-injurious behavior to age, cognitive functioning, and intrapersonal and interpersonal behaviors and events: A study of 100 developmentally delayed children was presented at the Sixth Congress of the International Association for the Scientific Study of Mental Retardation, Toronto, August 26, 1982, and will appear in the proceedings publication from the conference.

Additional articles in preparation are: "Prevalence and associated characteristics of self-injurious behavior in the community," "Past, present, and future directions in the analysis of self-injurious behavior," "Identification of antecedents to self-injurious behavior by teacher questionnaire," "Cognitive functioning of self-injurious individuals," and "Effects of task difficulty and preference in a large group of self-injurious individuals."

REFERENCE NOTES

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Appendix A

Program Contact Letters

June 22, 1981

Dear

As part of a dissertation research study, we are in the process of identifying children, ages 2-22 years, who reside in the community and exhibit self-injurious behaviors (e.g., self-biting, hitting, hairpulling, headbanging, etc.). An attempt is being made to identify all such children in Delaware, Franklin, Licking, and Marion Counties.

We are requesting your assistance in the identification process and, if applicable, in the study, as follows:

1. Please notify us as to whether you are or are not currently serving such children.
2. If you have served such children in the past, any information regarding the children's current educational placement (without releasing children's names) would be helpful.
3. If you are currently serving children who engage in self-injurious behaviors, we would like your permission to allow your staff and the identified children to participate in the study.

Enclosed is a copy of the proposal for your consideration. I am hopeful that you will agree to allow your staff and any children currently being served to participate in the study. In return for participation in the project, summary of findings for individual children will be forwarded to you, and an in-service workshop based on project findings can be arranged.

We would appreciate hearing from you as soon as possible. If you have any questions, please feel free to contact me. Thank you for your consideration of this matter.

Sincerely,

Ellen Weinhouse

Ellen Weinhouse
The Nisonger Center
(614) 422-8365

EW:kr

Enclosure

Self-Injurious Behavior Research Study

A. Purpose

The proposed research will investigate the relationship of intrapersonal and interpersonal behaviors and events in multihandicapped children, ages 2-6, 7-11, and 12-22 years, who reside in the community and engage in self-injurious behavior (SIB). Of particular interest are spatial and temporal patterns of SIB, range of antecedents to and functions of SIB, covariation of negative/manipulative and social/communicative behaviors with SIB, and developmental functions of antecedents to SIB. The relationship of age and developmental functioning to the above behaviors will be investigated with additional comparison among data collection methods and activity contrasts.

B. Method

Components of the study include: (1) Survey in several Ohio counties to investigate prevalence, parameters, and correlated characteristics of SIB; (2) Indepth assessment to identify cognitive profiles of SIBers; (3) Administration of a standard series of activities to enable systematic study of conditions, events, and behaviors antecedent to SIB within and across individuals; and (4) Observation of SIBers in the natural environment (for four consecutive days).

C. Subjects

Via the survey, all children, ages 2-22 years, who engage in SIB and reside in the community in at least four counties in Central Ohio will be identified. To be included in Parts 3 and 4, children must exhibit one of the major SIB topographies and have a recent history of 8-10 incidents of SIB or over 50 SIBs on more than one day. A subgroup of highest and lowest rate SIBers will be observed in Part 4.

D. Instrumentation

The survey (Part 1) will comprise administration of the Adaptive Behavior Scale (ABS) and an SIB-related questionnaire and review of educational records. Cognitive assessment (Part 2) will utilize a Piagetian-based cognitive assessment (sensorimotor, preoperational) and standardized intelligence test (Leiter, Hayes-Binet). Standard activities (Part 3) will involve tasks designed specifically for this study with a sequential observational coding system. The coding system will also be utilized for observation in the classroom (Part 4) and focuses on antecedent and consequent events as well as social/communicative behaviors that may covary with SIB. Videotapes of select children will be obtained for further analysis during Parts 2, 3, and 4 of the study.

E. Teacher Involvement

Teachers will be asked to complete the ABS and the SIB related questionnaire (Part 1 Survey) and will be asked to carry out the 30 minutes of standard activities. A brief interview will be needed to ascertain interventions in effect and object preferences prior to cognitive testing (Part 2). However, no direct teacher involvement is requested for Parts 2 and 4 of the study.

F. Target Dates

The research study will be carried out from January through December, 1981. Teachers and children will be scheduled as program permission and survey findings are acquired.

G. Data Collection

Cognitive assessments and observations will be carried out by Ellen Weinhouse. Lindsay Graves and Cheryl Huntzinger will assist in data collection for Part 3 (standard activities) and Part 4 (naturalistic observation).

H. Confidentiality

Permission for inclusion for Parts 1 through 4 will be obtained from program directors. Parent permission will be obtained for parent participation in the survey, review of educational records, and use of videotapes. All children and corresponding data will be assigned identification codes to protect confidentiality.

I. Direct Results and Benefits

Assessment results and individual descriptive data concerning SIB and associated behaviors will be forwarded to participating programs. An in-service training workshop for interested teachers can be arranged for Winter, 1982.

Appendix B

Parent Permission Letters

April 30, 1981

Dear

During the coming months we will be studying children who engage in various self-injurious behaviors (e.g., bites or hits him/herself) in order to try to understand these children better. We are trying to include every such child from 2 to 22 years of age who lives in Central Ohio. Our study involves administering two questionnaires to you and your child's teacher, assessing your child with tests that are geared to his/her level, having the teacher give a series of educational tasks, and observing your child in the classroom. At the end of the study, we will provide a summary of what we found for each child and an in-service training workshop.

We have received permission from your school to carry out the school related part of the study. We are now asking your permission to fill out the questionnaires and to allow us to review your child's school records.

Please fill out and return to us the enclosed, stamped postcard. We will be contacting you in the near future to explain the project in more detail and to answer any questions.

Sincerely,

Ellen Weinhouse
Ms. Ellen Weinhouse
The Nisonger Center
(614) 422-8365

EW:kr

Enclosure

April 30, 1981

Dear

During the coming months we will be studying children who engage in various self-injurious behaviors (e.g., bites or hits him/herself) in order to try to understand these children better. We are trying to include every such child from 2 to 22 years of age who lives in Central Ohio. Our study involves administering two questionnaires to you and your child's teacher, assessing your child with tests that are geared to his/her level, having the teacher give a series of educational tasks, and observing your child in the classroom. At the end of the study, we will provide a summary of what we found for each child and an in-service training workshop.

We are asking your permission to allow your child to participate in the study. Please fill out and return the attached permission slip to your school.

Sincerely,

Ellen Weinhouse

Ms. Ellen Weinhouse
The Nisonger Center
(614) 422-8365

EW:kr

- -

Code ______________

I ______agree ________ do not agree to allow my child to participate in the self-injurious behavior study.

______________________ Signature

______________________ Date

June 15, 1981

Dear

During the coming months we will be studying children who engage in various self-injurious behaviors (e.g., bites or hits him/herself) in order to try to understand these children better. We are trying to include every such child from 2 to 22 years of age who lives in Central Ohio. Our study involves administering two questionnaires to you and your child's teacher, assessing your child with cognitive tests that are geared to his/her level, having the teacher give a series of educational tests, and observing your child in the classroom. At the end of the study we will provide a summary of what we found for each child and an in-service training workshop.

The Franklin County Board of Mental Retardation and Developmental Disabilities has agreed to participate in the school related part of the study. We are now asking your permission to fill out the questionnaires and to allow us to review your child's school records and to administer the cognitive assessments.

Please fill out and return to us the enclosed, stamped postcard. (Young adults who are 18 years or older and have no guardian must sign the permission card themselves.)

Sincerely,

Ellen Weinhouse

Ellen Weinhouse
The Nisonger Center
(614) 422-8365

EW:kr

Enclosure

Ms. Weinhouse has received my permission to conduct her study with the children in our program. We consider the research to be valuable and of benefit to us in our programming with the children. If you give permission for cognitive testing and review of educational records, please be assured that we will monitor that use carefully.

Sincerely,

Aileen Lee, Ph.D.
Franklin County Board of Mental Retardation
and Developmental Disabilities

Appendix C

Screening Form

Self-Injurious Behavior Project

The following information is needed to ascertain how many children served by your program exhibit some form of self-injurious behavior. Behaviors include, but are not limited to, headbanging, head or face hitting, self-biting, self-digging or pinching, and ear or eye poking. The information is meant to be an estimate only and would not require an actual count of kinds or frequency of behaviors.

Thank you for your cooperation.

Sincerely,

Ellen Weinhouse

Ellen Weinhouse
The Nisonger Center

School/Program: ______________________________

Child	Age	Self-Injurious Behaviors	Estimated Frequency Per Day
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

SELF-INJURIOUS BEHAVIORS

For purposes of this study, SIB is defined as repeated contact of one body part with another (e.g., self-biting, face slapping, hairpulling, digging with fingernails) or contact of body with an object (e.g., banging head against floor, wall, or furniture) which has caused tissue damage in the past (e.g., reddening, bruising, callousing, infection, or destruction of tissue). SIB is distinguished from other repetitious or potentially harmful behaviors, including self directed SIB, self-stimulatory behavior, suicidal gestures, accidental injuries, and habit behaviors.

Behaviors considered to be self-injurious include (but are not limited to):

1. Head banging against external objects (wall, furniture, floor, other persons);
2. Biting own fingers, hand, arm, or other body part;
3. Face hitting utilizing one or both hands with fist or open palm and striking cheek, nose, chin, or skull;
4. Pulling own hair;
5. Scratching, digging, or pinching own body;
6. Hitting self with objects;
7. Biting objects;
8. Kicking self;
9. Eye or ear poking.

Appendix D

PROJECT TIME LINE

	February, 1981	March, 1981
Part I: Survey	Identify programs, develop forms	Develop questionnaire and card sort
Part II: Assessment		Develop sensori-motor prococol, communication checklist
Part III: Activities		
Part IV: Observation	Develop and revise coding system; begin observer training with videotapes	Train observers with videotape, live observation; begin reliability observations
Data Analysis		

	April, 1981	May, 1981
Part I: Survey	Contact programs, parent permission, test and revise questionnaires	Continue program contacts, administer questionnaires to MARCA Industries, OSSB, Nisonger ABAP/PS/ET
Part II: Assessment	Reliability from pilot tapes	OSSB
Part III: Activities	Develop activities, train activities	MARCA Industries (pilot); OSSB; Nisonger ABAP/PS/ET
Part IV: Observation	Continue reliability observations	Nisonger ABAP videotape
Data Analysis	Set up variable keys	Computer code questionnaires, card sorts (decks 1 & 2)

	June, 1981		July/August, 1981
Part I: Survey	Administer questionnaires to Hickory Knolls, past teachers		Continue program, parent contacts; administer questionnaires to Autistic Program, Nisonger ET/PS, St. Vincent's, past teachers, parents
Part II: Assessment	Hickory Knoll	School vacation	Autistic Program, referral
Part III: Activities	Hickory Knoll	School vacation	Autistic Program, Nisonger PS
Part IV: Observation	Hickory Knoll	School vacation	Reliability observations
Data Analysis	Computer code data decks 1 and 2		Keypunch decks 1 & 2; computer code assessments, activities, observations (decks 4, 5, & 6); reports

PROJECT TIME LINE (continued)

	September, 1981	October, 1981
Part I: Survey	Schedule schools; parent permission; questionnaires to Northeast, ARC Industries South	Administer questionnaires to Northridge, Southeast, ARC Industries North
Part II: Assessment	ARC Industries South	ARC Industries North, Northeast, Northridge, Southeast
Part III: Activities	ARC Industries South	ARC Industries North, Northeast, Northridge, Southeast
Part IV: Observation	Northeast Training Center	Northeast, Northridge, Southeast
Data Analysis	Computer code data decks 4, 5, & 6; psychological reports	Computer code data decks 1, 2, & 4

	November, 1981	December, 1981
Part I: Survey	Administer questionnaires to Kingswood, Family Learning Center, OSSB, Day Treatment.	Administer questionnaires to Forest Park, Love and Learn, Northeast, Colrain, Southeast, Maize, Northridge, parent
Part II: Assessment	Kingswood, Northridge, Southeast, OSSB, Day Treatment	Forest Park, Love and Learn, Northridge, Southeast, ADD Day Care
Part III: Activities	Kingswood, OSSB, Day Treatment	Forest Park, Northeast, Northridge, Love and Learn, Southeast, OSSB
Part IV: Observation		Forest Park, Love and Learn
Data Analysis	Computer code data decks 1, 2, & 4	Computer code decks 1, 2, 4, 5, & 6; psychological reports

	January, 1982	February, 1982
Part I: Survey	Day Treatment, OSSB, West Central Southside Day Care	MARCA Industries, MARCA School, A. G. Bell, ADD Day Care
Part II: Assessment	Day Treatment, West Central	MARCA Industries, MARCA School, A. G. Bell, Southeast, Day Treatment
Part III: Activities	OSSB, West Central	MARCA Industries, MARCA School, Day Treatment
Part IV: Observation	Kingswood, OSSB, West Central	Cancelled due to no show and snow days
Data Analysis	Keypunch, computer code	Key punch, computer code; psychological reports

PROJECT TIME LINE (continued)

	March, 1982	April, 1982
Part I: Survey	Parent; Nisonger ET, PS; computer code; analyses - questionnaire	Computer analysis - questionnaire, ABS
Part II: Assessment	Revise sensori-motor assessment VI and GI scales; plan analyses	Computer analysis - cognitive assessments
Part III: Activities	Computer code, keypunch	
Part IV: Observation	Computer code	
Data Analysis	Statistical consultation, keypunch, psychological reports	Statistical consultation, keypunch, psychological reports

	May, 1982	June/July, 1982
Part I: Survey	Computer analysis - ABS; write results - questionnaire	Computer analysis - Card Sort; write results, revise questionnaire, revise card sort.
Part II: Assessment	Computer analysis, write results	
Part III: Activities	Plan analyses	Reformat data, analysis, write results
Part IV: Observation	Computer code, keypunch	Keypunch
Data Analysis	Statistical consultation	Statistical consultation
Presentations	FCBMR/DD, State of Ohio Aversive Committee Workshop	

	August, 1982	September, 1982
Part I: Survey		
Part II: Assessment		
Part III: Activities		
Part IV: Observation	Reformat, analysis, write results	
Data Analysis	Dissertation completed	BEH final report completed
Presentations	IASSMD, Toronto	State of Ohio Aversive Committee, in-service for project participants

Appendix E

SIB Perception Questionnaire

Child ID ____________________
School ID ____________________

SIB TEACHER QUESTIONNAIRE

Child's Name ____________________________________

Birth date ________________ (C.A. ____________)

Person filling out questionnaire ____________________

Date ____

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in children's self-injurious behaviors as well as how the behaviors change over time.

Please fill in only those parts of the questionnaire that apply to the time you were involved with the child. If you do not know or cannot remember some aspect of the child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse
The Ohio State University

Background Information

1. Please list the time period during which you worked with the child.

   Started: __________ month ____________ year

   Stopped: __________ month ____________ year

2. In what capacity were you involved with the child?

3. Did the self-injurious behavior begin:

   ________ before you started working with the child.

   ________ after you started working with the child.

If the self-injurious behavior began before you started working with the child, proceed to Part II of the questionnaire. (Don't fill in Part I.)

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Child ID ____________________
School ID ____________________

SIB PARENT QUESTIONNAIRE

Child's Name ______________________________

Birth date ______________ (C.A. ______________)

Person filling out questionnaire ______________

Relation to Child ______________________

Date: ______________________________

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in children's self-injurious behaviors as well as how the behaviors change over time. As parents, you are in a unique position to provide this information. Please fill in as many parts of this questionnaire as you can. If you do not know or cannot remember some aspect of your child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse
The Ohio State University

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Child ID ______________________
School ID ______________________

SIB FOSTER PARENT, GROUP HOME, AND HOUSEPARENT QUESTIONNAIRE

Child's Name ______________________________

Birth Date ______________ (C.A. ______________)

Person filling out questionnaire ______________

Date ______________________________

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in chidren's self-injurious behaviors as well as how the behaviors change over time.

Please fill in only those parts of the questionnaire that apply to the time you were involved with the child. If you do not know or cannot remember some aspect of the child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse
The Nisonger Center
The Ohio State University

Background Information

1. Please list the time period during which the child lived with you (or in your group home or cottage):

   Started: ______________ month ______________ year

   Stopped: ______________ month ______________ year

2. In what capacity were you involved with the child?

3. Did the self-injurious behavior begin:

   __________ before you started working with the child.

   __________ after you started working with the child.

   If the self-injurious behavior began before you started working with the child, proceed to Part II of the questionnaire. (Don't fill in Part I).

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Part I. Onset of Behavior

Think back to the first time you noticed your child engaging in self-injurious behavior.

1. What age was your child when you noticed the first behavior?

___ less than 1 year
___ 1 year old
___ 2 years old
___ 3 years old
___ 4 years old
___ 5 years old
___ 6 years old
___ 7 years old
___ 8 years old
___ 9 years old
___ 10 years old
___ 11 years old
___ 12 years old or older

2. What was the first behavior you noticed?

___ a. biting own fingers or hand
___ b. banging head on the floor or other objects
___ c. hitting head with hands
___ d. other: ______________________

3. Under what conditions did the first behavior occur? (Please describe what happened beforehand and what you and your child were doing at the time.)

4. How was your child feeling at the time?

___ a. frustrated
___ b. angry
___ c. in pain
___ d. happy
___ e. other: ______________________

5. What did you do when you saw the behavior?

6. Why do you think the self-injurious behavior started?

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Part II. Kinds of Self-Injurious Behavior

Now think about the kinds of self-injurious behavior your child has engaged in over the years. (The attached list indicates kinds of behaviors children have been known to engage in.)

1. Please list your child's self-injurious behaviors in the order in which you noticed them and indicate the age at which each new behavior started (and stopped, if applicable). Also state what you remember caused the new behavior to occur.

Kind of Self-Injurious Behavior	Age Started	Stopped	Cause
(Earliest behavior in Part I) 1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			
11)			
12)			

2. Your child may have engaged in some of the behaviors you listed more often than others. Please list how often your child engaged in each kind of self-injurious behavior. Include only those behaviors he engaged in at each age.

When s/he was	2-6 years old	7-11 years old	12-22 years old	since September
(most frequent)	1.	1.	1.	1.
	2.	2.	2.	2.
	3.	3.	3.	3.
	4.	4.	4.	4.
	5.	5.	5.	5.
	6.	6.	6.	6.
	7.	7.	7.	7.
	8.	8.	8.	8.
	9.	9.	9.	9.
	10.	10.	10.	10.
	11.	11.	11.	11.
(least frequent)	12.	12.	12.	12.

Part III. Frequency of Self-Injurious Behavior

Now consider how frequently your child has engaged in all of his self-injurious behaviors combined. For each age period, put an "L" by the number that represents the lowest frequency and an "H" by the number that represents the highest frequency.

When s/he was	2-6 years old	7-11 years old	12-22 years old	since September
Less than once a week				
Once a day				
2-4 incidents per day				
5-10 incidents per day				
1-4 times per hour				
5-9 times per hour				
10-29 times per hour				
30-59 times per hour				
60-99 times per hour				
100-199 times per hour				
200-299 times per hour				
300-399 times per hour				
400-499 times per hour				
500-999 times per hour				
1,000 or more times per hour				

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Part IV. Interventions Used for Self-Injurious Behavior

Many procedures may have been used to try to control the self-injurious behavior both at home and at school. Please list as many approaches as you can remember and in the order in which they were tried. If no specific procedure was used, describe what did happen following the self-injurious behavior. Under "Who," indicate who used the procedure; e.g., home, school, or both. Under "Result," state the effects of the procedure. Start with your child's current age and the procedure presently in use.

School Year	When your child was:	Procedure	Who	Result
	22 years old			
	21 years old			
	20 years old			
	19 years old			
	18 years old			
	17 years old			
	16 years old			
	15 years old			
	14 years old			
	13 years old			
	12 years old			

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School Year	When your child was:	Procedure	Who	Result
	11 years old			
	10 years old			
	9 years old			
	8 years old			
	7 years old			
	6 years old			
	5 years old			
	4 years old			
	3 years old			
	2 years old			

Part V. Self-Restraint

1. Has your child ever engaged in any self-restraint behavior (used objects, materials, or his own hands to restrain himself from engaging in self-injurious behaviors)?

   _____ Yes _____ No

2. If you answered "yes" to the preceding question, please indicate which of the following behaviors you have seen, the age(s) at which they occurred, and what you think caused them to begin. Also star the behavior that occurred most often during each age range.

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Kind of Self-Restraint	Age Started	Stopped	Cause
1. Try to get people to hold his hands			
2. Hold own hands			
3. Pull sleeve over hand			
4. Put hands inside shirt			
5. Wrap hands in material (shirt, blanket, cloth)			
6. Wind string-like objects around hands or fingers			
7. Hook fingers in belt or belt loop			
8. Hook hands/fingers around objects (chairs, table legs, etc.)			
9. Hold objects in hands			
10. Place objects between fingers (lint, clothing, fuzz, small objects)			
11. Other:			
12. Other:			
13. Other:			
14. Other			

3. How often does your child engage in self-restraint behaviors?

1	2	3	4	5
seldom	less than half the time	about half the time	more than half the time	almost all the time

4. When your child engages in self-restraint behaviors, do the behaviors interfere with his engaging in other behaviors?

1	2	3	4
can't/won't use hands at all	uses hands for only a few activities	uses hands for many activities	uses hands for almost all activities

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VI. Conditions Under Which Self-Injurious Behaviors Occur

1. Please check the events that have occurred immediately before your child has engaged in a self-injurious behavior (incidents, events, or behaviors you think trigger the self-injurious behavior), Star the event that most often preceded self-injurious behavior during each age range.

Event	2-6 year old	7-11 years old	12-22 years old	Since September
After unexpected sounds or movements				
When requested to do specific thing				
After any adult speech (may vary from one time to the next				
When adult approaches child				
When left alone				
When touched				
When approaching certain areas or places				
After picking up, walking to, or doing something s/he wants				
After unsuccessfully trying to do an activity or task				
When familiar routines are changed				
When adult tries to stop child's self-stimulatory or other inappropriate behavior				
Nothing happened (no apparent reason)				
Other:				

2. Do you think your child can control (stop) his self-injurious behaviors when he engages in them? (Check one answer)

_____ almost never
_____ less than half the time
_____ half the time
_____ more than half the time
_____ most of the time

3. Why do you think your child started to engage in self-injurious behaviors?

4. Why do you think he continues to engage in self-injurious behaviors?

VII. Self-Injurious Behaviors During the Past Month - Card Sort

The attached set of cards represent events and behaviors that may have occurred during the past month immediately before and/or immediately after a self-injurious behavior. Please sort the cards into piles as follows:

PRIOR TO PAST MONTH

Pile 1: Never happened before or after self-injurious behavior

Pile 2: Used to happen before or after self-injurious behavior, but hasn't during the past month.

DURING THE PAST MONTH

Pile 3: Occurred infrequently (as compared to other events or behaviors) immediately before or after self-injurious behavior.

Pile 4: Occurred some of the time (as compared to other events or behaviors) immediately before or after self-injurious behavior

Pile 5: Occurred often (as compared to other events or behaviors) immediately before or after self-injurious behaviors.

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Appendix F

Specific Topography Variations

- 1 HEADBANGING (HB)
  - 2 Headbang to objects
    - 3 Tables
    - 4 Floor
    - 5 Wall
    - 6 Other objects
  - 7 Teeth bang to objects
  - 8 To persons
    - 9 Adults
    - 10 Peers
  - 11 To self
    - 12 Hand
    - 13 Arm
    - 14 Leg (sitting position)
- 15 BITING SELF (BS)
  - 16 Hand
    - 17 Side/palm of hand
    - 18 Top of hand
    - 19 Chew hand
  - 20 Fingers
    - 21 Thumb
    - 22 Middle fingers
    - 23 Ring fingers
  - 21 Arm
    - 22 Upper arm
    - 23 Forearm
    - 24 Wrist
  - 25 Foot (Big toe)
  - 26 Clothing
    - 27 Shirt sleeve
    - 28 Pants leg
    - 29 Neckline
- 30 FACE HITTING (FH)
  - 31 To face/open palm
    - 32 Forehead
    - 33 Cheek
    - 34 Nose
    - 35 Chin
  - 36 To skull/open palm
    - 37 Side of head
    - 38 Back of head
  - 37 To ear/fist or open palm
  - 38 To face/fist
    - 39 Forehead
    - 40 Cheek
    - 41 Nose
    - 42 Chin
  - 43 To skull/fist
    - 44 Side of head
    - 45 Back of head
  - 46 Upper arm to face
- 47 HAIR PULLING (HP)
    - 48 Back of hair
    - 49 Side of hair
    - 50 Front of hair
- 51 DIGGING/SCRATCHING SELF (DS)
  - 52 Pinch
    - 53 Arm
    - 54 Legs
    - 55 Torso
  - 56 Dig
    - 57 Hands
    - 58 Arm
    - 59 Scalp
  - 60 Scratch
    - 61 Face
    - 62 Arms
- 63 KNEE TO HEAD HITTING (KH)
  - 64 Headbang
    - 65 Cheek to knee
    - 66 Head to knee
    - 67 Nose to knee
  - 68 Bite knee
- 69 OBJECT TO FACE HITTING (OF)
    - 70 Forehand
    - 71 Face (cheek/skull)
    - 72 Chin
- 73 KICKING SELF (KS)
  - 74 Leg (kick shin)
  - 75 Foot (step on foot)
  - 76 Object
    - 77 Knee to table
    - 78 Rub leg against chair
- 79 EYE POKING (EP)
    - 80 With thumb
    - 81 With finger
- 82 OTHER SIB (SB)
  - 83 Face hitting
    - 84 Knuckle
      - 85 To chin
      - 86 To teeth
    - 87 Hand press
      - 88 To face
      - 89 To chin
      - 90 To nose
    - 91 Fist (to teeth)
  - 92 Objects to face hitting
    - 93 To mouth
      - 94 Press objects to mouth
      - 95 Hit objects to teeth
    - 96 To head (dump objects)
  - 97 Bite objects
  - 98 Ear
    - 99 Ear poke
    - 100 Hit ear
    - 101 Pull/press ear
    - 102 Pull ear lobe
    - 103 Scratch inside ear

- 104 Hit other body part
    - 105 Upper arm
    - 106 Chest/sides
    - 107 Back
    - 108 Hip
    - 109 Rear end (spank)
    - 110 Thigh/leg
- 111 Hit objects with hand
    - 112 Floor
    - 113 Objects
- 114 Other
    - 115 Grit teeth (chip teeth)
    - 116 Pull mouth
    - 117 Throw head back (crack)
    - 118 Pick nose
    - 119 Pick nails
    - 120 Rub head against objects
    - 121 Bang shoulder to wall
    - 122 Throw self on floor and/or against objects
    - 123 Slam feet on floor
    - 124 Head to shoulder or upper arm

Actual number of different behaviors=94

MAJOR CATEGORIES

HB = 1-14
BS = 15-29
FH = 30-46 (+83-91)
HP = 47-50
DS = 51-62
KH = 63-68
OF = 69-72 (+92-96)
KS = 73-78
EP = 79-81
SB = 82-124

SUBCATEGORIES

HB = 2(3-6), 7, 8(9-10), 11(12-14)
BS = 16(17-19), 20(21-23), 21(22-24), 25, 26(27-29)
FH = 31(32-35), 36(37-38), 37, 38(39-42), 43(44-45), 46
HP = 47(48-50)
DS = 52(53-55), 56(57-59), 60(61-62)
KH = 64(65-67), 68
OF = 69(70,71,72)
KS = 74, 75, 76(77-78)
EP = 79(80-81)
SB = 83(84-91), 92(93-96), 97, 98(99-103), 104(105-110), 111(112-113), 114(115-124)

FURTHER SUBDIVISION OF SB 83

84(85-86), 87(88-90), 91

Appendix G

Interventions for Self-Injurious Behavior

Major Code	Subcategory
1. Aversive Consequence (1-14)	1. Negative Physical (1-6)
	2. Negative Speech (7-8)
	3. Time Out (9-10)
	4. Attention Withdrawal (11-14)
2. Restraint (15-20)	5. Material Restraint (15-16)
	6. Physical Restraint (17-20)
3. Alternative Behavior (21-27)	7. Differential Reinforcement (21-22)
	8. Functional Alternative (23-25)
	9. Verbal Request (26-27)
4. Positive Consequence (28-40)	10. Positive Physical (28-31)
	11. Positive Speech (32)
	12. Change Activity (33-38)
	13. Vestibular/Tactile (39-40)
5. Ignore (41)	14. None (41)
6. Counseling (42)	15. None (42)
7. Restructuring Environment (43)	16. None (43)

Specific Interventions in Use

- ADMINISTER AVERSIVE CONSEQUENCE

Negative Physical Contact (NP)

1 Forcefully bring arms down
2 Administer aversive (water squirt, paddle, hit hand with object
3 Floor restraint
4 Facial screening
5 Positive practice overcorrection or maintain a position for a prolonged period
6 Restitutive overcorrection

Negative Speech (NB, NI, SN)

7 Verbal/signed reprimand (e.g., "No," "No ______," "Stop, ____", "Hands down!"
8 Derogatory comment/threat (NI, NB) (to act age appropriately, etc.)

Time Out as Removal from Situation (no code; T.O.=activity code)

9 Isolate in room (in corner, in middle of room, away from group, in padded chair, on floor
10 Isolate out of room (in bathroom, hallway)

Attention Withdrawal (IG, NR, AL)

11 Ignore until behavior stops
12 Walk away from child
13 Brief attention withdrawal (5-10" no SIB)
14 Long attention withdrawal (2 minutes)

RESTRAINT (RA)

Material Restraint (usually continuous RA)

15 Helmet (with and without face guard, fading to hat)
16 Other material restraints (e.g., straight jacket, mittens, arm splints, wrist ties to chair, restraint chair)

Physical Restraint (RA)

17 Hold hands down or on surface, hold child
18 Hold child in lap and restrain
19 Basket hold (arms crossed in front and held behind)
20 Block SIB (with or without object)

REQUIRE ALTERNATIVE BEHAVIOR (no code)

Differential Reinforcement (PR)

21 Token economy
22 Positive reinforcement for no SIB (intermittent, unspecified schedule, specified amount of work)

Train/Prompt Functional Alternative Behaviors (no code)

23 Incompatible (keep child active, etc.)
24 Communication (train, require, reinforce)
25 Redirect to task (repetition of antecedent, require continuation of work, etc.)

Verbal Request to Engage in Alternative Behavior (BR/CR/SN)

26 Request to engage in incompatible behavior (BR/CR/SN) (hands in lap, hands on table, clasp hands)
27 Request to engage in appropriate behavior (BR) (work, etc.)

ADMINISTER POSITIVE CONSEQUENCE

Positive Physical Contact (PC)

28 Remove or redirect hand (to touch body part appropriately, to engage in incompatible behavior such as holding hands, to hit an object instead of self)
29 Hold child's hands
30 Comfort (stroke face, hold, rock, cuddle, etc.)
31 Move child away from object (e.g., away from object was headbanging against)

Positive Speech (IS, IR)

32 Discuss problem (ask if child feels OK, talk with child)

Change Materials/Activity (no code)

33 Give object to hold/mouth (toy, book, etc.)
34 Attempt to meet child's needs (give desired object, etc.)

35 Redirect to different activity
36 Distract
37 Take for ride (in care chair, wagon, etc.)
38 Give time to relax

Vestibular/Tactile Stimulation (TT)

39 Vestibular activity (rocking chair, water bed, rocking boat, bobath ball, vestibular swing)
40 Tactile stimulation (tactile stimulation, deep pressure massage)

41 IGNORE (continue ongoing activity)

42 COUNSELING

43 RESTRUCTURE ENVIRONMENT

Eliminate known antecedents, e.g., avoid verbal negatives, etc.

Appendix H

Revised SIB Perception Questionnaire

Child ID ____________________
School ID ____________________

SIB TEACHER QUESTIONNAIRE

Child's Name ______________________________

Birth date ____________ (C.A. __________)

Person filling out questionnaire ____________________

Date ______________________________

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in children's self-injurious behaviors as well as how the behaviors change over time.

Please fill in only those parts of the questionnaire that apply to the time you were involved with the child. If you do not know or cannot remember some aspect of the child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse

Ellen Weinhouse
The Ohio State University

Background Information

1. Please list the time period during which you worked with the child.

   Started: __________ month __________ year

   Stopped: __________ month __________ year

2. In what capacity were you involved with the child?

3. Did the self-injurious behavior begin:

   ________ before you started working with the child.

   ________ after you started working with the child.

If the self-injurious behavior began before you started working with the child, proceed to Part II of the questionnaire. (Don't fill in Part I.)

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Child ID ____________________
School ID ____________________

SIB PARENT QUESTIONNAIRE

Child's Name ______________________________________

Birth date ________________ (C.A. ________________)

Person filling out questionnaire ______________________

Relation to Child ____________________________________

Date: ____

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in children's self-injurious behaviors as well as how the behaviors change over time. As parents, you are in a unique position to provide this information. Please fill in as many parts of this questionnaire as you can. If you do not know or cannot remember some aspect of your child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse
The Ohio State University

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Child ID ______________________
School ID ______________________

SIB FOSTER PARENT, GROUP HOME, AND HOUSEPARENT QUESTIONNAIRE

Child's Name ______________________________

Birth Date ______________ (C.A. ______________)

Person filling out questionnaire ______________________

Date ______________________________

The purpose of this questionnaire is to help us learn more about children who engage in self-injurious behavior. We are particularly interested in identifying similarities and differences in children's self-injurious behaviors as well as how the behaviors change over time.

Please fill in only those parts of the questionnaire that apply to the time you were involved with the child. If you do not know or cannot remember some aspect of the child's behavior, please indicate this.

Thank you for your assistance.

Sincerely,

Ellen Weinhouse
The Nisonger Center
The Ohio State University

Background Information

1. Please list the time period during which the child lived with you (or in your group home or cottage):

   Started: ______________ month ______________ year

   Stopped: ______________ month ______________ year

2. In what capacity were you involved with the child?

3. Did the self-injurious behavior begin:

   __________ before you started working with the child.

   __________ after you started working with the child.

   If the self-injurious behavior began before you started working with the child, proceed to Part II of the questionnaire. (Don't fill in Part I).

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Part I. Onset of Behavior

Think back to the first time you noticed your child engaging in self-injurious behavior.

1. What age was your child when you noticed the first behavior?

____ less than 1 year
____ 1 year old
____ 2 years old
____ 3 years old
____ 4 years old
____ 5 years old
____ 6 years old
____ 7 years old
____ 8 years old
____ 9 years old
____ 10 years old
____ 11 years old
____ 12 years old or older

2. What was the first behavior you noticed?

____ a. biting own fingers or hand
____ b. banging head on the floor or other objects
____ c. hitting head with hands
____ d. other: ________________________

3. Under what conditions did the first behavior occur? (Please describe what happened beforehand and what you and your child were doing at the time.)

4. How was your child feeling at the time?

____ a. frustrated
____ b. angry
____ c. in pain
____ d. happy
____ e. other: ________________________

5. What did you do when you saw the behavior?

6. Why do you think the self-injurious behavior started?

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Part II. Kinds of Self-Injurious Behavior

Now think about the kinds of self-injurious behavior your child has engaged in over the years. (The attached list indicates kinds of behaviors children have been known to engage in.)

1. Please list your child's self-injurious behaviors in the order in which you noticed them and indicate the age at which each new behavior started (and stopped, if applicable). Also state what you remember caused the new behavior to occur.

Kind of Self-Injurious Behavior	Age Started	Stopped	Cause
(Earliest behavior in Part I) 1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			
11)			
12)			

2. Your child may have engaged in some of the behaviors you listed more often than others. Please list how often your child engaged in each kind of self-injurious behavior. Include only those behaviors he engaged in at each age.

When s/he was	2-6 years old	7-11 years old	12-22 years old	since September
(most frequent)	1.	1.	1.	1.
	2.	2.	2.	2.
	3.	3.	3.	3.
	4.	4.	4.	4.
	5.	5.	5.	5.
	6.	6.	6.	6.
	7.	7.	7.	7.
	8.	8.	8.	8.
	9.	9.	9.	9.
	10.	10.	10.	10.
	11.	11.	11.	11.
(least frequent)	12.	12.	12.	12.

Part III. Frequency of Self-Injurious Behavior

Now consider how frequently your child has engaged in all of his self-injurious behaviors combined. For each age period, put an "L" by the number that represents the lowest frequency and an "H" by the number that represents the highest frequency.

When s/he was	2-6 years old	7-11 years old	12-22 years old	since September
Less than once a week				
Once a day				
2-4 incidents per day				
5-10 incidents per day				
1-4 times per hour				
5-9 times per hour				
10-29 times per hour				
30-59 times per hour				
60-99 times per hour				
100-199 times per hour				
200-299 times per hour				
300-399 times per hour				
400-499 times per hour				
500-999 times per hour				
1,000 or more times per hour				

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Part IV. Interventions Used for Self-Injurious Behavior

Many procedures may have been used to try to control the self-injurious behavior both at home and at school. Please list as many approaches as you can remember and in the order in which they were tried. If no specific procedure was used, describe what did happen following the self-injurious behavior. Under "Who," indicate who used the procedure; e.g., home, school, or both. Under "Result," state the effects of the procedure. Start with your child's current age and the procedure presently in use.

School Year	When your child was:	Procedure	Who	Result
	22 years old			
	21 years old			
	20 years old			
	19 years old			
	18 years old			
	17 years old			
	16 years old			
	15 years old			
	14 years old			
	13 years old			
	12 years old			

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School Year	When your child was:	Procedure	Who	Result
	11 years old			
	10 years old			
	9 years old			
	8 years old			
	7 years old			
	6 years old			
	5 years old			
	4 years old			
	3 years old			
	2 years old			

Part V. Self-Restraint

1. Has your child ever engaged in any self-restraint behavior (used objects, materials, or his own hands to restrain himself from engaging in self-injurious behaviors)?

   ______ Yes ______ No

2. If you answered "yes" to the preceding question, please indicate which of the following behaviors you have seen, the age(s) at which they occurred, and what you think caused them to begin. Also star the behavior that occurred most often during each age range.

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Kind of Self-Restraint	Age Started	Stopped	Cause
1. Try to get people to hold his hands			
2. Hold own hands			
3. Pull sleeve over hand			
4. Put hands inside shirt			
5. Wrap hands in material (shirt, blanket, cloth)			
6. Wind string-like objects around hands or fingers			
7. Hook fingers in belt or belt loop			
8. Hook hands/fingers around objects (chairs, table legs, etc.)			
9. Hold objects in hands			
10. Place objects between fingers (lint, clothing, fuzz, small objects)			
11. Other:			
12. Other:			
13. Other:			
14. Other			

3. How often does your child engage in self-restraint behaviors?

1	2	3	4	5
seldom	less than half the time	about half the time	more than half the time	almost all the time

4. When your child engages in self-restraint behaviors, do the behaviors interfere with his engaging in other behaviors?

1	2	3	4
can't/won't use hands at all	uses hands for only a few activities	uses hands for many activities	uses hands for almost all activities

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VI. Conditions Under Which Self-Injurious Behaviors Occur

1. Do you think your child can control (stop) his self-injurious behaviors when he engages in them? (Check one answer)

_______ almost never
_______ less than half the time
_______ half the time
_______ more than half the time
_______ most of the time

2. Why do you think your child started to engage in self-injurious behaviors?

3. Why do you think he continues to engage in self-injurious behaviors?

Appendix A: Examples of Self-Injurious Behavior

Self-injurious behavior is defined as repeated contact of one body part with another (e.g., self-biting, face slapping, hair pulling, digging with fingernails) or contact of body with an object (e.g., banging head against floor, wall, or furniture) which has caused tissue damage in the past (e.g., reddening, bruising, callousing, infection, or destruction of tissue). Self-injurious behavior is distinguished from other repetitious or potentially harmful behaviors, including self directed SIB, self-stimulatory behavior, suicidal gestures, accidental injuries, and habit behaviors. Examples of 10 general categories of self-injurious behavior and common subtypes of these categories are listed below.

General Topography	Topography Subtype
HB Head banging	Head bang to objects Teeth bang to objects Head bang to persons
BS Biting self	Bite hand Bite fingers Bite arm Bite foot Bite clothing
FH Face hitting	Face hit with open palm Skull/ear hit with open palm Face hit with fist Skull/ear hit with fist Face hit with upper arm
HP Hair pulling	Hair pull
DS Digging/scratching self	Pinch self Dig nails in body part Scratch self
KH Knee to head hitting	Bang knee to head Bite knee
OF Object to face hitting	Object to face hit
KS Kicking self	Kick shin Foot to foot press Knee/leg to object
EP Eye poking	Poke eye
SB Other SIB	Knuckle to face Hand press to face Object to head (not face or head hitting) Bite object Ear pull/poke Hit other body part Hit objects with hand Other

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Appendix B: Central Ohio Community Classroom Norms

These norms were derived form questionnaires completed by teachers of 77 children, ages 2-22 years old, who engaged in self-injurious behavior and were enrolled in community programs. Included were programs for mentally retarded and developmentally delayed, visually handicapped, hearing handicapped, deaf-blind, multiply handicapped, emotionally disturbed/behavior disordered, autistic, and normal day care children.

Steps for using the norm table are as follows:

1. Find the child's lowest frequency of self-injurious behavior under "Since September" on page 3. Convert the frequency as follows:

Less than once a week = 0.01
Once a day = 0.03
2-4 incidents per day = 0.67
5-10 incidents per day = 1.60
1-4 times per hour = 4.0
5-9 times per hour = 9.0
10-29 times per hour = 29.0
30-59 times per hour = 59.0
60-99 times per hour = 99.0
100-199 times per hour = 199
200-299 times per hour = 299
300-399 times per hour = 399
400-499 times per hour = 499
500-999 times per hour = 999
1,000 or more times per hour = 1,000+

Circle the corresponding number under "Lowest Frequency" in the norm table for the child's age.

2. Find the child's highest frequency of self-injurious behavior under "Since September" on page 3. Convert the frequency as in step 1 and circle the corresponding number in the norm table.

3. Using "Appendix A: Examples of Self-Injurious Behavior" as a guide, classify each behavior listed on page 2 as one of the ten general topographies. Circle every general topography reported to be in the child's repertoire (last column in the norm table).

4. Count the number of general topographies circled in step 3. Circle this number under "Number General Topographies" in the norm table.

The norm tables for frequency and number of topographies were based on cumulative percent of children. Therefore, higher percentiles reflect increasingly severe behavior. For example, a score at the 90th percentile means that 89% of children engaged in less frequent self-injurious behavior, exhibited fewer different topographies, or did not engage in the circled topography type. Conversely, a score entered at the 10th percentile would indicate mild self-injurious behavior (90 percent of children engaging in more frequent or diverse self-injurious behavior). Scores above the 100th percentile indicate more severe self-injurious behaviors than that exhibited by the normative sample.

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Table B1 2-6 Year Olds

Percentiles	Lowest Frequency	Highest Frequency	Number General Topographies	Topography Type
No children with:	59+	199+	6+	KH, KS
100	29	99	5	
	9 4	59	4	EP OF
90				
	1.60	29	3	DS
80	0.67			HP
70				SB
	0.03	9		
60			2	
50				HB, BC FH
		4.0		
40		0.67		
	0.01			
30				
			1	
20				
10				
	0.0	0.0		
Score Range	0.01-1000+	0.01-1000+	1-10	1-10

Based on 26 2-6 year olds enrolled in community classrooms.

Table B2 7-11 Year Olds

Percentiles	Lowest Frequency	Highest Frequency	Number General Topographies	Topography Type
No children with:	99+	499+	7+	KS, EP
100	59	199	6	
	29	99		KH
90				
	9		5	DS, OF
80				
	4	59	4 3	HP
70				
				SB
60				
	1.60 0.67 0.03			
50		29		
			2	BS
40				
	0.01	9		HB
30				
		0.67		
20				
			1	FH
10				
	0.0	0.03		
Score Range	0.01-1000+	0.01-1000+	1-10	1-10

Based on 14 7-11 year olds enrolled in community classrooms.

Table B3 12-22 Year Olds

Percentiles	Lowest Frequency	Highest Frequency	Number General Topographies	Topography Type
No children with:	199+	-	9+	-
100	99 59 29 9.0	1000+ 999 499	8 6 5	OF KH, KS
90	4.0	199 99 59	4	HP EP
80	1.60	29	3	DS
70				
60	0.67			SB HB
50			2	
40		9 4		FH BS
30	0.03	1.60		
20	0.01	0.67	1	
10	0.0	0.01 0.0		
Score Range	0.01-1000+	0.01-1000+	1-10	1-10

Based on 37 12-22 year olds enrolled in community classrooms.

Appendix I

ANTECEDENT/CONSEQUENT CARD SORT

Child I.D. ____________________ Date: ____________________

School: ____________________ B.D.: ____________ (C.A.:________)

Sorted by: ____________________ Administered by: ____________________

___ Present teacher ___ Past teacher

___ Parent ___ Foster parent/group home ___ Residential care staff

Time period covered: ______________________________

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					GEN ES	ENVIRONMENTAL STIMULI Accidental events in the environment.
					GEN-AE	ENVIRONMENTAL STIMULI - AUDITORY Unexpected or loud sounds or other sounds not directed to the child.
					AE1	People talk loudly
					AE2	Music is loud or volume is turned up.
					AE3	An object is dropped and makes a loud sound.
					AE4	The PA system goes on.
					AE5	Another child cries
					AE6	Music is turned on.
					AE7	Music is turned off.
					AE8	Another child yells.
					AE9	Another child is reprimanded verbally.
					AE10	A fire or police siren sounds.
					AE11	Another child activates a musical instrument or produces a sound with an object.
					AE12	Adult activates a sound producing object somewhere in room.
					GEN VE	ENVIRONMENTAL STIMULI - VISUAL Actions by other persons or objects that are not directed to the child.
					VE1	Elevator door opens or closes.
					VE2	Door opens when child is standing in front of it.
					VE3/AP	Child sees any adult enter the room.
					VE4/AP	Child sees a particular adult(s) enter the room.
					VE5/AL	Child sees any adult leave the room.
					VE6/AL	Child sees a particular adult(s) leave the room.
					VE7	Adult is preparing or getting food (may or may not be for child).
					VE8	Adult is putting food away.
					VE9/WT	Food is visible but out of reach or not available to child.
					VE10	Adult gets or sets up tasks for another child.
					VE11	Adult puts away tasks used by another child.
					VE12/WT	Child sees an object he likes.
					VE13/WT	Child sees an object he doesn't like.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		ENVIRONMENTAL STIMULI - TACTILE/KINESTHETIC
					GEN TE	Child experiences an unepected texture or movement.
					TE1/CB	Child bumps into or trips over an object.
					TE2/CB	Child walks on uneven ground.
					TE3/CB	While dressing or undressing, child's clothing gets stuck halfway on or off.
					TE4/TT	Child's chair is moved while he is sitting in it.
					TE5	Another person bumps into the child.
					TE6	Someone splashes child with water.
					TE7	Someone accidentally moves gross motor or vestibular equipment while child is on the equipment. (Examples: Accidentally rock a rocking boat, get on or bounce on trampoline, move swing.)
						ADULT-PEER INTERACTION
					GEN PI	Adult interacts with other children.
					PI1	Adult talks to another child.
					PI2	Adult plays with another child.
					PI3	Adult works with another child.
					PI4	Adult reprimands another child.
					PI5	Another child is sitting on adult's lap.
					PI6	Adult stands near other children.
					PI7	Adult approaches another child.
						SOCIAL ATTENTION
					GEN SOC R	Adult does not give or is not giving attention to child.
					GEN SOC AV	Adult interacts with child.
						PROXIMITY - ADULT APPROACH
					GEN AP	Adult moves in a direction toward child.
					AP1	Adult walks toward child (to join child).
					AP2	Adult walks in child's direction, but is actually going somewhere else.
					AP3	Adult sits down next to child.
					AP4	Adult moves own chair closer to child.
					AP5	Adult leans toward child.
					AP6	Adult reaches toward child.
					AP7	Adult turns to face child.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		PROXIMITY - ADULT LEAVES
					GEN AL	Adult moves in a direction away from child.
					AL1	Adult walks away from child (leaves child).
					AL2	Adult walks past child.
					AL3	Adult stands up after having been seated near child.
					AL4	Adult turns away from child.
						ADULT PHYSICAL CONTACT
					GEN PC	Adult touches child
					PC1	Adult physically readjusts child's body position (moves child's hand, arm, etc.).
					PC2	Adult physically turns child's head (e.g., to look at something).
					PC3	Adult physically prompts child.
					PC4/CA/TT	Adult physically prompts child to brush his teeth.
					PC5/CA	Adult physically prompts child to pick up an object.
					PC6/CA/RS	Adult physically prompts child to put down an object.
					PC7/CA	Adult physically prompts child to dress or undress.
					PC8/CA	Adult physically prompts child to manipulate task materials.
					PC9	Adult picks up child.
					PC10	Adult holds child on his/her lap.
					PC11	Adult holds child's hand(s).
					PC12/AL	Adult puts child down (after holding child).
					PC13/TA	Adult lets go of child's hand(s).
					PC14/AP	Adult puts arm around child.
					PC15/AL	Adult removes arm from around child.
					PC16	Adult wipes child's nose.
					PC17	Adult adjusts child's clothing.
					PC18/TT	Adult brushes child's hair.
					PC19	Adult washes child's face.
					PC20	Adult physically prompts child to wash himself.
					PC21	Adult pats child's back or hands (playful or affectionate), hugs child, or kisses child.
						TASK PRESENTATION VARIABLES
					GEN TP	Adult presents task materials visually, tactually, or auditorily.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		TASK PRESENTATION - VISUAL
					GEN VT	Adult manipulates or moves task materials as child observes.
					VT1	Adult gets child's task materials (from shelf, cupboard, etc.).
					VT2/AP	Adult carries task materials to table.
					VT3	Adult places child's task materials on table.
					VT4	Adult presents a task trial.
					VT5/CA	Adult gives child an object as part of task.
					VT6	Adult rearranges task materials.
					VT7	Adult holds up task or other materials to show to child.
					VT8	Adult moves task materials as a locational prompt (to make task easier).
					VT9/ER	Adult takes out or moves task materials after child has made an error.
					VT10/CR	Adult points to task materials as a direction to child.
					VT11	Adult puts task materials back into container.
					VT12	Adult removes task materials from table.
					VT13/AL	Adult carries task materials to put them away.
						TASK PRESENTATION - TACTILE/KINESTHETIC
					GEN TT 1	Adult applies substance, texture, or object as stimulation to child's body part.
					TT1	Adult applies cream or lotion to child's body part.
					TT2	Adult rubs material or texture on child's body part.
					TT3	Adult pours liquid substance on child's body part (e.g., water during water play).
					TT4	Adult pours nonliquid substance on child's body part (e.g., styrofoam pieces).
					TT5	Adult applies vibrator to child's body part.
					TT6	Adult turns off or removes vibrator from child's body part.
					GEN TT 2	Adult stops applying a substance, texture, or object as stimulation to child's body part.
					GEN TT/K1	Adult activates movement producing equipment (while child is on equipment). (Example: swing, trampoline, etc.
					TT7	Adult activates vestibular equipment (swings child, spins child, etc.).
					GEN TT/K2	Adult stops movement producing equipment. (Example: swing, trampoline, etc.)
						TASK PRESENTATION - AUDITORY
					GEN AT	Adult causes sound materials or other objects to sound.
					AT1	Adult causes task materials to sound by shaking them.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					AT2	Adult activates a musical toy (music box, ferris wheel, etc.).
					AT3	Adult shakes or hits a musical instrument (bells, tambourine, sticks, etc.).
					AT4	Adult taps surface or object as locational cue.
					GEN-TP	TASK PERFORMANCE BEHAVIOR Child attempts to carry out assigned task or behavior requested by adult (may or may not be correct).
					GEN-CC/WK	TASK PERFORMANCE - COMPLY CORRECT Child carries out assigned task or behavior requested by an adult correctly.
					CC1	Child places form or puzzle piece correctly.
					CC2	Child uses correct sign on request.
					CC3	Child follows verbal or signed commands correctly.
					CC4	Child sorts or matches objects correctly.
					CC5/WK	Child engages in daily living skill activities correctly.
					CC6	Child performs a task trial correctly.
					CC7/WK	Child completes an entire task correctly.
					CC8	Child gets materials as requested by an adult.
					CC9	Child puts away materials as requested by an adult.
					GEN AX/WK	TASK PERFORMANCE - APPROXIMATION Child partially complies with adult request or partially carries out assigned task (i.e., does part of what was requested).
					AX1	Child puts task piece partially in correct place (e.g., form half way in hole, object partially on outline, etc.)
					AX2	Child engages in similar but not exact hand position for sign, part but not all of sign, or part but not all of phrase or sentence required or requested by an adult (or says similar or part of verbal utterance required or requested).
					AX3	Child follows part, but not all, of verbal or signed command.
					AX4	Child engages in a similar but not exact action requested or required of him.
					GEN ER	TASK PERFORMANCE - ERROR Child carries out an assigned task or behavior requested by an adult incorrectly (makes a mistake or error).
					ER1	Child puts task piece(s) in wrong place (wrong formboard hole, matched to wrong object, etc.).
					ER2	Child produces wrong sign or word (different than that requested).

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					ER3	Child performs action with or on an object that is different than the one requested of him.
					ER4	Child incorrectly follows a verbal or signed command.
					GEN CB	OTHER CHILD BEHAVIORS Child engages in a discrete behavior intentionally or accidentally.
					CB1/(CC,RS, AX,ER)	(See AT1, AT2, AT3) Child picks up an object.
					CB2/TS (CC, RS, AX, ER)	Child puts down an object.
					CB3	Child places an object somewhere or acts on it in some way.
					CB4/TS	Child drops an object.
					CB5/(RS)	Child picks up a dropped object.
					CB6	Child engages in a gross motor movement (e.g., stands up, sits down, etc.).
					GEN PR	POSITIVE REINFORCEMENT Adult administers positive reinforcer.
					PR1	Adult gives child edible reinforcer.
					PR2	Child is eating or drinking edible reinforcer.
					PR3	Adult verbally praises child.
					PR4	Adult touches child as praise (e.g., pats child's back).
					PR5	Adult gives a favorite object as reinforcer.
					PR6	Adult gives activity as reinforcer (e.g., piggyback ride, spin in chair).
					GEN PR/NA	Adult (attempts to) removes or terminates a reinforcer.
					PR/NA7	Adult (attempts to) take back an edible reinforcer.
					PR/NA8	Adult (attempts to) take back a favorite object previously given as a reinforcer.
					PR/NA9	Adult (attempts to) terminate an activity initially provided as a reinforcer.
					GEN IG	IGNORE Adult intentionally does not respond to a child behavior or withdraws attention.
					IG1	Adult engages in attention withdrawal contingent on specific non-SIB, maladaptive child behaviors.
					IG2	Adult engages in attention withdrawal contingent on SIBs.
					IG3	Adult engages in attention withdrawal or does not respond when child does not carry out behavior or task requested by adult.
					IG4	Child deliberately does not respond to behavior request by an adult.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					IG5	Child deliberately does not carry out activity requested by adult.
					GEN RA	RESTRAINT - ADULT INITIATED Adult holds child's body part, applies a restraint material, or blocks child's actions in order to prevent child from engaging in SIB.
					RA1	Adult holds child's hands or arms down and maintains that position to prevent SIB.
					RA2	Adult places helmet on child for headbanging or head hitting.
					RA3	Adult wraps cloth around child's arms to prevent SIB.
					RA4	Adult places material splints around child's arms to prevent SIB (carpet pieces, newspaper, arm splints, etc.)
					RA5	Adult gives child string or other material known to serve as an SIB restraint.
					RA6	Adult places mittens or similar object on child's hands to prevent SIB.
					RA7	Adult ties child's arms to furniture to prevent SIB.
					RA8	Adult ties child's legs to furniture to prevent SIB.
					RA9	Adult ties child's arms to own body to prevent SIB.
					RA10	Adult physically blocks child's SIB (places arm or own body between child's body part and attempted contact with head, object, etc.).
					RA11/BR	Adult asks child to engage in a restraint behavior.
					GEN RS	RESTRAINT - CHILD INITIATED Child attempts to use objects, own clothing, or own body parts as a means of self-restraint (to prevent SIB).
					RS1(AE/WT)	Child sees restraint materials (e.g., helmet, arm splints, cloth, string, etc.).
					RS2	Child holds own hands as a means of preventing SIB.
					RS3	Child pulls shirt sleeve over hand as a means of preventing SIB.
					RS4	Child puts hands inside shirt (or coat) as a means of preventing SIB.
					RS5	Child hooks fingers in belt loop, belt, or other loop-like part of clothing as a means of preventing SIB.
					RS6	Child holds objects for prolonged periods (as a means of preventing SIB).
					RS7	Child places lint, fuzz from other clothing, or small objects between fingers as a means of preventing SIB.
					RS8	Child winds string-like or cloth objects around fingers or hands as a means of preventing SIB.
					RS9	Child hooks arms or legs around a stationary object as a means of preventing SIB (e.g., around chair back or legs, etc.).
					GEN TA	RESTRAINT - ADULT TERMINATED Adult removes physical or material restraints used to prevent SIB.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					TA1	Adult lets go of child's hands after having held them down as a means of preventing SIB.
					TA2	Adult begins to untie or loosen restraint material used by adult to prevent SIB (untie cloth, undo helmet buckle, deflate or remove tape on arm splints, etc.).
					TA3	Adult removes a material restraint (removes helmet, cloth, arm splints, or other material that had previously been applied by an adult to prevent SIB).
					TA4/BR	Adult requests child to give up self-restraint material or cease a self-restraint action (restraint initiated by the child to prevent SIB).
					TA5/NA or NP	Adult physically undoes child's self-restraint action that child has initiated as a means of preventing SIB.
					GEN-TS	RESTRAINT - CHILD TERMINATED Child (attempts to) remove restraining material, release materials used for self-restraint, or otherwise attempts to terminate restraint utilized to prevent SIB.
					TS1/NP	Child (attempts to) remove adult's hands while adult holds child's body part to prevent SIB.
					TS2	Child attempts to untie or otherwise remove a material restraint (untie helmet, splints, cloth, etc.) previously applied by an adult to prevent SIB.
					TS3	Child actually removes an adult applied material restraint (helmet, splints, cloth).
					TS4	Child drops an object used for self-restraint (used by child to prevent SIB).
					TS5	Child removes hands from shirt (engaged in as a means of preventing SIB).
					TS6	Child unhooks hands from belt loops or other loop-like parts of clothing (engaged in as a means of preventing SIB).
					TS7	Child removes small objects or lint from between fingers (used as a means of preventing SIB).
					TS8	Child undoes, puts down, or gives to an adult objects that were held or wound around the fingers or hands by the child as a means of preventing SIB.
					TS9/NA	Child throws an object or material previously applied as a means of preventing SIB (a child or adult applied restraint).
					GEN WT	WATCH Child is watching or looking at persons(s), materials, or activities or adult is watching child.
					WT1	Child is looking at adult who is working with the child.
					WT2	Child is looking at materials he/she is working with.
					WT3	Child is observing an adult(s) who is not currently working with the child.
					WT4	Child is looking at an object or material that he/she is not currently using.
					WT5	Child is watching an activity taking place in the room that he/she is not involved in.
					WT6	Child is watching persons in a group activity that he/she is involved in. (Child does not have to be an active participant in the group.)
					WT7	Child is listening to persons or activities in the room.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					WT8	An adult is watching the child.
					GEN WK	WORK Child is independently carrying out activities that are requested by an adult or are part of his daily routine.
					GEN PA	(See CC, AX, ER) INDEPENDENT OR PLAY ACTIVITY Child is engaging in self-initiated activities (may be during tasks or free time).
					GEN UN	UNOCCUPIED Child is not engaged in any focused activity or is waiting.
					UN1	Child is waiting (sitting or standing, unoccupied) at adult's request or as part of daily routine.
					UN2	Child is supposed to be working, but is sitting or standing without doing anything.
					UN3	Child is free to do as he pleases and sits or stands doing nothing.
					UN4	Child roams around room, but does not focus his attention on anything in particular.
					GEN NR 1	NO RESPONSE Child does not perceive a behavior directed to him (i.e., doesn't notice behavior) or adult doesn't notice behavior directed to him.
					GEN NR 2	Child does not respond to a behavior directed to him, but the behavior doesn't require a response.
					NR1	Child directs some communication to adult, but adult doesn't hear or see it.
					NR2	Adult directs some communication to child, but child doesn't hear or see it.
					NR3	Child watches adult, but adult is not aware of being watched.
					NR4	Child engages in a negative behavior (SIB or non-SIB) but adult doesn't see it (has back turned or is occupied with something or someone else).
					NR5	Adult engages in some physical contact with child that doesn't require a response from the child (i.e., adult performs a caretaking activity, shadows or completely physically prompts child, etc.).
					NR6	Child engages in a physical contact behavior toward adult that doesn't require a response (i.e., leans on adult, comb's adult's hair, etc.).
					NR7	Child engages in independent activity which does not require or involve a response from adult (adult is not watching).
					GEN SS	SELF-STIMULATORY BEHAVIOR Child engages in a self-stimulation behavior (rocking, flicking, light gazing, head wagging, spinning objects, ruminating, etc.).
					GEN SS/ NP, NB	Adult physically stops or verbally tells child to cease self-stimulatory behavior.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
						WALK (TRANSITIONAL BEHAVIOR)
					GEN WA	Child is leaving an activity that has just ended or is going to the next activity or task area.
					WA1/CB	Child stands up to leave after task or activity is finished.
					WA2	Child is walking away from a task or activity that has just ended.
					WA3	Child is leaving a room to go to another room (as part of assigned activity).
					WA4	Child is walking in hallway to go to next activity.
					WA5	Child is approaching room for next activity.
					WA6	Child enters room for next activity.
					WA7	Child approaches task area (i.e., table or materials).
					WA8(CB)	Child sits down for next task or activity.
						NONVERBAL SOCIAL COMMUNICATION
					GEN CH S/C	Child communicates nonverbally (indicates he does or does not want something, asks a question or for permission, asks for help, points out or shows something, etc.).
					GEN CH SO	Child directs his attention to an object by reaching for it, looking at it, engaging in simple motor movement (opens mouth, moves arms or legs), or vocalizing.
					GEN CH SA	Child directs his attention to an adult by reaching to touch adult, looking at adult, engaging in simple motor movement (move arms or legs briefly), or vocalizing.
					GEN CH CO	Child looks at an object and signals toward the object (holds hand toward object to indicate he wants object), tries to open a container, tries to activate an object, pulls at an obstacle, or goes to an object or location and waits. Behavior is followed by a pause and may or may not be accompanied by vocalizing.
					GEN CH CP	Child looks at an adult and signals to the adult (lifts arms to be picked up, starts a familiar action game, tugs at or touches adult, waves, etc.).
					GEN CH TR	Child pushes an adult's hand toward an object or places an object near an adult.
					GEN CH CA	Child brings an object and an adult into physical contact
					CH CA1	Child gives an object to adult on command (or request).
					CH CA2	Child spontaneously gives an object to an adult.
					CH CA3	Child takes an offered object from adult.
					CH CA4	Child places adult's hand on an object (usually for assistance).
					CH CA5	Child physically prompts an adult to act on an object (moves adult's hand to indicate what s/he wants adult to do).
					CH CA6	Child physically prompts adult to use one object on another object.
					CH CA7	Child leads adult to some location.

PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
N	U	I	S	O		
					GEN AD CA	Child brings adult and object into physical contact.
					AD CA1	Adult gives child an object.
					AD CA2	Adult takes an offered object from child.
					AD CA3	Adult physically prompts child to interact with an object (places child's hand on object).
					AD CA4	Adult assists child with an object (e.g., helps child carry, hold, or manipulate an object).
					AD CA5	Adult physically leads child to a location or object.
					GEN CH CR	Child engages in a referential gesture as a means of communicating.
					CH CR1	Child points to a person or object.
					CH CR2	Child holds up an object to show to an adult.
					CH CR3	Child engages in a pretend behavior with or without an object (e.g., pretends to eat).
					CH CR4	Child gestures (not formal sign) to communicate.
					GEN AD CR	Adult engages in a gesture (to communicate to child).
					AD CR1	Adult points to an object, location, or person.
					AD CR2	Adult holds hand out as a means of requesting child to give adult an object.
					AD CR3	Adult gestures to child to indicate what child is to do (e.g., gestures turning a jar cap, pushing on push top, etc.).
					AD CR4	Adult engages in a pretend action.
					GEN CH CN	Child combines two or more behaviors (gestures, actions with objects, vocalizations) while looking at an adult as a means of communicating.
					GEN NG	NONVERBAL NEGATIVE/MANIPULATIVE BEHAVIOR NEGATIVE MOTOR-GESTURAL BEHAVIORS Child engages in a negative or manipulative behavior. (Behavior does not involve objects, aggression toward other persons, or self-injurious behavior.)
					NG1	Child (attempts to) turns head or body away from adult or adult offered object.
					NG2	Child pulls away or (tries to) moves or runs away from adult.
					NG3	Child (tries to) crawl over furniture to get away from adult.
					NG4	Child resists adult's presentations of objects or physical prompts by becoming rigid or pursing lips.
					NG5	Child falls on floor limp.
					NG6	Child exhibits frustration by bouncing in chair.
					NG7	Child puts head on desk or covers face with hands.
					NG8	Child intentionally does opposite of what he was told to do or does what he was told not to do.

	PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
NA	N	U	I	S	O		
							NEGATIVE ACTIONS ON OBJECTS
						GEN CH NA	Child acts on an object in a negative or destructive manner.
						CH NA1	Child tears own clothing.
						CH NA2	Child (attempts to) remove own clothing.
						CH NA3	Child pushes over furniture.
						CH NA4	Child throws objects.
						CH NA5	Child bangs objects on table (not play).
						CH NA6	Child (tries to) grab objects from an adult.
						CH NA7	Child clutches object to prevent adult from taking object
						GEN AD NA	Adult takes an object away from child. (Child has not offered object or indicated he wants to give up object.)
							NEGATIVE PHYSICAL CONTACT
						GEN CH NP	Child engages in aggressive action toward adult.
						CH NP1	Child hits, bites, scratches, kicks, pulls hair, or otherwise attempts to injure adult.
						CH NP2	Child hits, bites, scratches, kicks, pulls hair, or otherwise attempts to injure another child.
						CH NP3/CP2	Child pushes adult's hand away to indicate s/he doesn't want adult to do something.
						CH NP4	Child pushes adult away.
						CH NP5	Child attempts to pry adult's fingers open (e.g., when adult is holding on to child).
						CH NP6	Child throws an object at or hits adult with an object.
						CH NP7	Child grabs adult's clothing.
						GEN AD NP	Adult engages in forceful physical contact with child or administers some form of punishment.
						AD NP1	Adult forcefully stops, inhibits, or administers a punisher following self-stimulatory behavior.
						AD NP2	Adult forcefully stops or administers a punisher following a negative behavior by child (e.g., negative actions on objects, aggression toward others, non-compliant behaviors, etc.).
						AD NP3	Adult forcefully inhibits or administers a punisher following self-injurious behavior.
							NEGATIVE VOCALIZATIONS
						GEN NV	Child engages in negative vocalizations.
						NV1	Child fusses or whines.
						NV2	Child cries.
						NV3	Child screams.

	PRIOR		PAST MO			CODE	CATEGORY/ANTECEDENT/CONSEQUENT
NA	N	U	I	S	O		
							POSITIVE SYMBOLIC SOCIAL/COMMUNICATION
						GEN CH SYM	Child speaks or signs (asks for something, makes a comment, etc.
						CH BR1	Child asks for something, says he wants something, or asks adult do do something (verbally).
						CH IS2	Child makes a statement (verbally).
						CH IR3	Child asks for information (verbally).
						CH BR-SN4	Child signs to ask for something.
						CH IS-SN5	Child signs to make a statement.
						CH IR-SN6	Child signs to ask for information.
						GEN AD SYM-SP	Adult speaks to child.
						AD SYM1	Adult speaks or signs to child and child misunderstands.
						AD BR	Adult tells child to do something (anything).
						AD BR1	Adult tells child to do something in particular.
						AD IS	Adult comments on something.
						AD IR	Adult asks child for information (e.g., adult asks a question).
						AD SN	Adult signs to child.
						AD BR-SN	Adult signs to child to tell child to do something.
						AD IS-SN	Adult signs to child to comment on something.
						AD IR-SN	Adult signs to child to ask child for information (e.g., adult asks a question).
							NEGATIVE SYMBOLIC SOCIAL/COMMUNICATION
						GEN CH N-SYM	Child says or signs something in a negative manner (says something negative or uses negative intonation).
						GEN CH NB	Child demands that adult do something or that s/he wants something.
						GEN CH NI	Child threatens to do something or tries to manipulate situation verbally. (Manipulations include complaining or being ill when child is not ill, etc.)
						GEN AD N-SYM	Adult reprimands, warns, or criticizes child.
						GEN AD NB	Adult reprimands child, tells child to stop doing something.
						GEN AD IS	Adult warns child or tells child what will happen if s/he engages in some behavior.

Appendix J

ANTECEDENT/CONSEQUENT CARD SORT FOR SELF-INJURIOUS BEHAVIOR

(Short Form, Revised July 1982, E. Weinhouse)

Date: ______________________________

Child I.D. ______________________________

B.D.: ______________________________

School: ______________________________

Administered By: ______________________________

Sorted By: ______________________________

___ Present teacher ___ Past teacher

___ Parent ___ Foster parent/group home ___ Residential care staff

Time period covered: ______________________________

Instructions

The attached set of items represent events and behaviors that may have occurred during the past month immediately before and/or immediately after a self-injurious behavior. Please mark each item as follows:

PRIOR TO PAST MONTH

N (Never): Never happened before or after self-injurious behavior

U (Used to): Used to happen before or after self-injurious behavior, but hasn't during the past month.

DURING THE PAST MONTH

I (Infrequently): Occurred infrequently (less than half the time) immediately before or after self-injurious behavior.

S (Some of the time): Occurred some of the time (about half the time) immediately before or after self-injurious behavior.

O (Often): Occurred often (more than half the time) immediately before or after self-injurious behavior.

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
	ENVIRONMENTAL STIMULI - AUDITORY						
1. AEL	Loud sounds - people talk loudly, music is loud or volume is turned up, another child cries or yells, and/or another child is reprimanded verbally.						#8
2. AES	Sudden sounds - an object is dropped and makes a loud sound, the PA system goes on, and/or a fire or police siren sounds.						#8
3. AEM	Musical sounds - music is turned on, music is turned off, another child activates a musical instrument or produces sound with an object, and/or adult activates a sound producing object somewhere in the room.						#7
	ENVIRONMENTAL STIMULI - VISUAL						
4. VED	Door opens when child is standing in front of it, elevator door opens or closes.						#4
5. VEP	Child sees a particular adult or any adult(s) enter the room or leave the room.						#4
6. VEF	Adult is preparing or getting food (may or may not be for child), adult is putting away food, or food is visible but out of reach or not available to child.						#5
7. VEO	Adult gets or sets up tasks for another child; adult puts away tasks used by another child; child sees an object he likes or an object he doesn't like.						#4
	ENVIRONMENTAL STIMULI - TACTILE/KINESTHETIC						
8. TEU	Unexpected movements - another person bumps into child. Someone splashes child with water; someone accidentally moves gross motor or vestibular equipment while child is on the equipment. (Examples: Accidentally rock a rocking boat, get on or bounce a trampoline, move swing.)						#5
9. TE/CB	Child bumps into or trips over an object; child walks on uneven ground.						#5
	ADULT-PEER INTERACTION						
10. PI	Adult talks to, plays with, works with, stands near, or approaches another child; another child is sitting on an adult's lap.						#4
	PROXIMITY - ADULT APPROACH						
11. AP	Adult walks in child's direction (but is actually going somewhere else), walks toward child (to join child), sits down next to child, moves own chair closer to child, reaches toward child, or turns to face child.						#1

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
12. AL	PROXIMITY - ADULT LEAVE Adult turns away from child, stands after having been seated near child, walks away from child (leaves child), or walks past child.						#4
13. PC/ CA	ADULT PHYSICAL CONTACT Physical prompts - Adult physically readjusts child's body position (moves child's hand, arm, etc.); physically turns child's head; physically prompts child to pick up an object, put down an object, interact with an object (by putting child's hand on object), or manipulate task materials; assists child with an object (e.g., helps child carry, hold, or manipulate an object); or physically leads child to a location or object.						#5
14. PCG	General physical contact - Adult picks up child, holds child on his or her lap, puts child down (after holding child), holds child's hand(s), lets go of child's hand(s), puts arm around child, removes arm from around child, wipes child's nose, pats child's back or hands (playful or affectionate), hugs child, or kisses child.						#5
15. PCC	Physical contact, caretaking - Adult brushes child's hair, washes child's face, or physically prompts child to wash himself or brush his teeth.						#5
16. VTP	TASK PRESENTATION - VISUAL Adult gets child's task materials (from shelf, cupboard, etc.), carries task materials to table, places child's task materials on table, presents a task trial, gives child an object as part of task, rearranges task materials, holds up task or other materials to show to child, moves task materials as a locational prompt (to make task easier), or takes out or moves task materials after child has made an error.						#1
17. VTR	Adult puts task materials back into container, removes task materials from table, or carries task materials to put them away. Adult takes an object away from child (child has not offered object or indicated he wants to give up object).						#4
18. TT	TASK PRESENTATION - TACTILE/KINESTHETIC Adult applies substance or texture as stimulation; e.g., applies cream or lotion to child's body part, rubs material or texture on child's body part (such as during water play), or pours nonliquid substance on child's body part (such as styrofoam pieces). Adult adjusts child's clothing. Adult activates movement producing or vestibular equipment; swing, trampoline, spin chair, etc. Adult stops applying a substance, texture, or object as stimulation to child's body part. Adult stops movement producing equipment.						#5

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR N	PRIOR U	PAST MONTH I	PAST MONTH S	PAST MONTH O	CLUSTER
19. TT/V	Adult applies vibrator to body part or turns off or removes vibrator from child's body part.						#2
20. AT	TASK PRESENTATION - AUDITORY Adult causes task materials to sound by shaking them, activates a musical toy (music box, ferric wheel, etc.), shakes or hits a musical instrument (bells, tambourine, sticks, etc.), or taps surface or object as a locational cue.						#7
21. CC	TASK PERFORMANCE - COMPLY CORRECT Child carries out a task or behavior requested by an adult correctly; e.g., places form or puzzle piece correctly, follows verbal or signed commands correctly, sorts or matches objects correctly, performs a task trial correctly, completes an entire task correctly, or gets materials as requested by an adult.						#11
22. AX/ ER	TASK PERFORMANCE - APPROXIMATION AND ERROR Child partially complies with adult request or partially carries out assigned task (i.e., does part of what was requested); e.g., puts task piece partially in correct place (such as form half way in hole, object partially on outline, etc.); follows part, but not all, of verbal or signed command, engages in a similar but not exact action requested or required of him. Child carries out an assigned task or behavior by an adult incorrectly (makes a mistake or error); e.g., puts task piece(s) in wrong place (wrong formboard hole, matched to wrong object, etc.), performs action with or on an object that is different than the one requested of him, follows a verbal or sign command incorrectly.						#1
23.TPSN	Child uses correct sign on request, engages in an approximation of a sign (similar but not exact hand position, part but not all of sign, or part but not all of phrase or sentence required or requested by adult); or produces wrong sign or word (different than that requested).						#11
24. CB	OTHER CHILD BEHAVIORS Child engages in a discrete behavior intentionally or accidentally; e.g., puts down an object, places an object somewhere or acts on it in some way, drops an object, picks up a dropped object, engages in a gross motor movement (e.g., stands up, sits down, etc.).						#1
25. PR	POSITIVE REINFORCEMENT Administer positive reinforcer - Adult gives child edible reinforcer. Child is eating or drinking edible reinforcer. Adult verbally praises child, touches child as praise (e.g., pats child's back), gives a favorite object as reinforcer, or gives activity as reinforcer (e.g., piggyback ride, spin in chair).						#11

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
26.PRNA	Remove or terminate reinforcer - Adult (attempts to) take back an edible reinforcer, (attempts to) take back a favorite object previously given as a reinforcer, or (attempts to) terminate an activity initially provided as a reinforcer.						#4
27. IG	IGNORE Adult intentionally does not respond to a child behavior or withdraws attention. I.e., adult engages in attention withdrawal contingent on specific non-SIB, maladaptive behaviors; engages in attention withdrawal contingent on SIBs; engages in attention withdrawal or does not respond when child does not carry out behavior or task requested by an adult.						#4
28. RAP	ADULT RESTRAINT Adult physical restraint - Adult holds child's hands or arms down and maintains that position to prevent SIB; adult physically blocks child's SIB (places arm or own body between child's body part and attempted contact with head, object, etc.); adult lets go of child's hands after having held them down as a means of preventing SIB; or child (attempts to) remove adult's hands while adult holds child's body part to prevent SIB.						#6
29. RAM	Adult material restraint - Adult wraps cloth around child's arms to prevent SIB, gives child string or other material known to serve as self-restraint, or places mittens or similar object on child's hands to prevent SIB. Child attempts to untie (or otherwise remove) or throws a material restraint (helmet, splints, cloth) previously applied by an adult. Child drops an object used for self-restraint.						#2
30. RAH	Helmet and termination of material restraint - Adult places helmet on child for headbanging or head hitting. Adult begins to untie, loosen, or actually removes a material restraint (untie cloth, undo helmet buckle, deflate or remove tape on arm splints, removes materials). Child actually removes an adult applied restraint (helmet, splints, cloth).						#7
31. RAT	Ties - Adult ties child's arms or legs to furniture to prevent SIB.						#9
32. RAS	Splints - Adult places material splints around child's arms to prevent SIB (carpet pieces, newspaper, armsplints, etc.); child sees restraint materials (e.g., helmet, arm splints, cloth, string, etc.).						#9

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
33. RSO	**SELF-RESTRAINT** Self-restraint with objects - Child hooks fingers in belt loop, belt, or other loop-like part of clothing; holds objects for prolonged periods; places lint, fuzz from clothing, or small objects between fingers; or hooks arms or legs around a stationary object (e.g., around chair back or legs) as a means of preventing SIB. Adult requests child to give up self-restraint material or cease a self-restraint action; adult physically undoes child's self-restraint. Child unhooks hands from belt loops or loop-like parts of clothing.						#10
34. RSC	Child pulls shirt sleeves over hand as a means of preventing SIB or removes hands from shirt.						#10
35.RSOTH	Child puts hands inside shirt (or coat) as a means of preventing SIB. Child undoes, puts down, or gives to an adult objects that were held or wound around the fingers or hands by the child as a means of preventing SIB.						#10
36. WT	**WATCH** Child is looking at adult who is working with the child, observing an adult(s) who is not currently working with the child, or is listening to persons or activities in the room						#1
37.UN/SS	**UNOCCUPIED AND SELF-STIMULATORY BEHAVIOR** Child is not engaged in any focused activity or is waiting; child is waiting (sitting or standing, unoccupied) at adult's request as part of daily routine; child is supposed to be working, but is sitting or standing without doing anything; child is free to do as he pleases and sits or stands doing nothing; or child roams around room, but does not focus his attention on anything in particular. Child engages in self-stimulatory behavior (rocking, flicking, light gazing, head wagging, spinning objects, ruminating, etc.).						#6
38. SSNP	Adult physically stops or verbally tells child to cease self-stimulatory behavior.						#6
39. ADNR	**NO RESPONSE** Adult doesn't respond to a behavior directed to him - child watches adult, engages in an independent activity (which does not require a response from adult), or engages in a negative behavior (SIB or non-SIB), but adult is not aware of or doesn't see these behaviors. Adult watches child.						#1
40. WA	**WALKING (TRANSITIONAL BEHAVIOR)** Child is leaving an activity that has just ended or is going to the next activity or task area-Child stands up to leave or is walking away from a task or activity that has just ended; is leaving a room to go to another room, walking in hallway, approaching room, or enters room for next activity; and child approaches task area (i.e., table or material) or sits down for next task or activity.						#1

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
	NONVERBAL SOCIAL COMMUNICATION						
41.CH/SC	Simple nonverbal communication directed toward objects - Child directs his attention to an object or an adult by reaching to object or to touch adult, looking at object or adult, engaging in a simple motor movement (moves arms or legs briefly), or vocalizing. Child looks at an object and signals toward the object (holds hand toward object to indicate he wants object), tries to open a container or activate object, pulls at an obstacle, goes to an object or location and waits. (Behavior is accompanied by a pause and may or may not be accompanied by vocalizing.) Child pushes adult's hand toward an object or places an object near an adult (does not actually bring adult and object into contact).						#4
42. CHCA	Simple nonverbal communication directed to a person - Child looks at an adult and signals to the adult (lifts arms to be picked up, starts a familiar action game, tugs at or touches adult, waves, etc.), gives an object to adult on command (or request), gives an object to adult spontaneously, takes an offered object from adult, or places adult's hand on object (usually for assistance).						#11
43.CHCA/BR	Coordinated nonverbal communication - Child physically prompts an adult to act on an object (moves adult's hand to indicate what s/he wants adult to do), physically prompts adult to use one object on another object, leads adult to some location, or signs to ask for something.						#11
44.ADCR/BR	Adult nonverbal and verbal behavior requests - Adult gives child an object; points to an object, location, or person; holds hand out as a means of requesting child to give adult an object; gestures to indicate what child is to do (e.g., gestures turning a jar cap, pushing on a push top, etc.); verbally tells child to do something (anything) or something in particular; or speaks or signs to child and child misunderstands.						#1
	NONVERBAL NEGATIVE/MANIPULATIVE BEHAVIORS						
45. NGA	Child negative motor-gestural behavior - Child (attempts to) turns head or body away from adult or adult offered object, resists adult's presentation of objects or physical prompts by becoming rigid or pursing lips, pushes adult's hand away to indicate s/he doesn't want adult to do something; or pushes adult away.						#1
46. NAO	Child negative actions on objects - Child exhibits frustration by bouncing in chair, pushes over furniture, throws objects, or bangs objects on table (not play).						#3
47.NART	Child (tries to) grab objects from adult, clutches object to prevent adult from taking object, or attempts to pry adult's fingers open (e.g., when adult is holding on to child).						#3

CODE	CATEGORY/ANTECEDENT/CONSEQUENT	PRIOR		PAST MONTH			CLUSTER
		N	U	I	S	O	
48. NP	Child negative physical contact - Child puts head on desk or covers face with hands. Child hits, bites, scratches, kicks, pulls hair, or otherwise attempts to injure adult or another child. Child throws an object at or hits adult with an object. Child grabs adult's clothing.						#3
49. ADNP	Adult engages in forceful physical contact or administers some form of punishment; e.g., adult forcefully stops, inhibits, or administers a punisher following self-stimulatory behavior; following a negative behavior by child (such as negative actions on objects, aggression toward others, noncompliant behaviors, etc.); or following self-injurious behavior.						#6
50. NV	Child negative vocalizations - Child fusses, whines, cries, or screams.						#4
	POSITIVE SYMBOLIC SOCIAL/COMMUNICATION						
51. CHSP	Child speech - Child asks for something, says he wants something, or asks adult to do something (verbally); child makes a statement (verbally); or child asks for information (verbally).						#3
52. CHSN	Child sign - Child signs to make a statement or to ask for information.						#2
53. ADSP/SN	Adult speaks or signs to comment on something or to ask for information (e.g., adult asks a question).						#11
	NEGATIVE SYMBOLIC SOCIAL/COMMUNICATION						
54. CHNSP	Child says or signs something in a negative manner (says something negative or uses negative intonation). Child threatens to do something or tries to manipulate situation verbally. (Manipulations include complaining of being ill when child is not ill, etc.)						#3
55. ADNSP	Adult reprimands or criticizes child, tells child to stop doing something, or warns child (tells child what will happen if s/he engages in some behavior).						#3

Administration and Scoring Procedures

Administration

The Antecedent/Consequent Card Sort should be completed by persons who spend considerable time on a daily basis with the individual; e.g., teachers, direct care staff, or parents. Persons who see the individual for brief or infrequent time periods usually have not encountered the range of situations covered in the card sort. Also persons who have worked with the individual for several months usually have less difficulty answering the items than persons who have worked with the child for only a month or less.

When administering the card sort, have the informant read the instructions first. Next, explain that the card sort is organized according to categories and that the items represent instances of the category. Use the first section as an example; e.g., "This part refers to sounds that are not directed to the child." Point out the rating columns and repeat what each one represents ("N" for never occurred immediately before or after self-injurious behavior, etc.). Watch the person mark the first few items to make sure he or she understands how to fill out the card sort. It is helpful to remain nearby to answer questions that arise during completion of the items.

Common questions that arise are: how to mark events or behaviors that don't occur in a given environment or aren't in the child's repertoire (check "never"); what a given item means (an example usually helps); whether the item includes a particular behavior (if not listed in the item, the instance is usually in an adjacent item or dealt with later in the card sort); and how to mark events that precede self-injurious behavior but don't really "cause" it (mark all events that immediately precede self-injurious behavior, provided the individual perceives that event, but regardless of whether or not it "causes" self-injurious behavior). If the informant begins to skip items, tell him or her to mark all items in the order in which they are listed. Also, if more than one column per item is checked, point out that only one column is marked per item.

Scoring

Each item is scored as follows: N=0, U=1, I=2, S=3, O=4. Enter each item's score in the table below. Add all the scores in the first cluster and divide by the number of items in that cluster. Repeat this procedure with each cluster in turn. Mark the cluster scores on the profile to derive the individual's current pattern of antecedents to self-injurious behavior.

Cluster 1: Presentation of and Reactions to Mands

11. AP ______
16. VTP ______
22. AX/ER ______
24. CB ______
36. WT ______
39. ADNR ______
40. WA ______
44. ADCR/BR ______
45. NGA ______

Total Score ______
(÷ by 9) ______

Cluster 2: Miscellaneous 1

19. TT/V ______
29. RAM ______
52. CHSN ______

Total Score ______
(÷ by 3) ______

Cluster 3: Avoidance Escalation

46. NAO ______
47. NART ______
48. NP ______
51. CHSP ______
54. CHSNP ______
55. ADNSP ______

Total Score ______
(÷ by 6) ______

Cluster 4: Visual Stimuli and Related Reactions

4. VED ______
5. VEP ______
7. VEO ______
10. PI ______
12. AL ______
17. VTR ______
26. PRNA ______
27. IG ______
41. CHS/C ______
50. NV ______

Total Score ______
(÷ by 10) ______

Cluster 5: Physical Contact and Tactile/Kinesthetic Stimuli

6. VEF ______
8. TEU ______
9. TE/CB ______
13. PC/CA ______
14. PCG ______
15. PCC ______
18. TT ______

Total Score ______
(÷ by 7) ______

Cluster 6: Self-Stimulatory Behavior and Negative Consequences

28. RAP ______
37. UN/SS ______
38. SSNP ______
49. ADNP ______

Total Score ______
(÷ by 4) ______

Cluster 7: Miscellaneous 2

3. AEM ______
20. AT ______
30. RAH ______

Total Score ______
(÷ by 3) ______

Cluster 8: Unexpected and Loud Sounds

1. AEL ______
2. AES ______

Total Score ______
(÷ by 2) ______

Cluster 9: Restraint with Ties

31. RAT ______
32. RAS ______

Total Score ______
(÷ by 2) ______

Cluster 10: Self-Restraint

33. RSO ______
34. RSC ______
35. RSOTH ______

Total Score ______
(÷ by 3) ______

Cluster 11: Appropriate Behavior

21. CC ______
23. TPSN ______
25. PR ______
42. CHCA ______
43. CHCA/BR ______
53. ADSP/SN ______

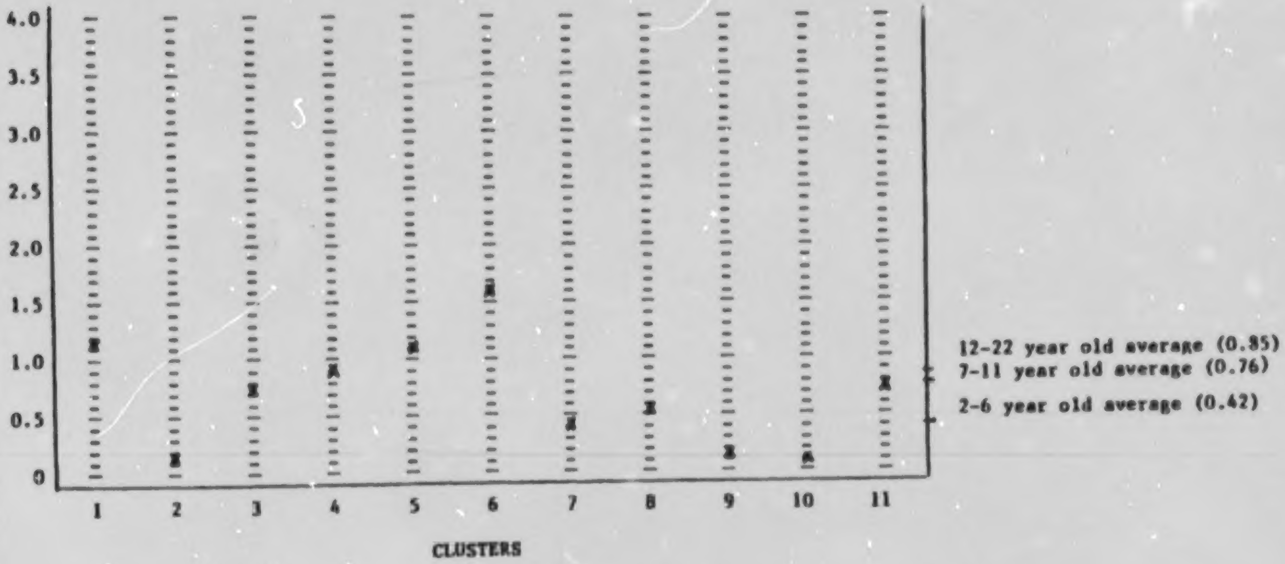
Total Score ______
(÷ by 6) ______

Antecedent/Consequent Profile

Name: ______________________ **Date:** ______________________

School: ______________________ **B.D.:** ______________ (C.A.: __________)

Sorted by: ______________________ **Administered by:** ______________________



x = average score on each cluster for 79 children, ages 2-22 years old (based on long form).

– = average profile scores for each age group were obtained by summing the scores for each cluster and dividing by 11 (based on long form).

Appendix K

SENSORI-MOTOR ASSESSMENT
SCORING SHEET

Name/I.D. ______________________________ Date ________________________

School ________________________________ Birthdate ____________________

Assessor ______________________________ C.A. _________________________

Reliability ____________________________

Sensori-Motor Profile

		OP	ME	CA	SR	VI	GI	SCH
Stage I.		1	1	1	-	1 2	-	1
Stage II		2 -	2 3	2 -	1 2	3 4	- 1	2 3
Stage III	Beg	3	4	3	3	5	2	4
	Mid	4	-	-	4	-	-	5
	End	5	5	4	5	6	3 4	-
Stage IV	Beg	6	6	-	6	-	5	6
	Mid	7	-	-	-	-	6 7	7
	End	8 9	7	5,6	7	7	8 9	8
Stage V	Beg	10	8 9	7	8	8 9	10	9
	Mid	11	10	-	9 10	10 11	11 12	10
	End	12	11	8	11	12	13	11 12
Stage VI		- 13	12 13	- 9	12 -	-	14 15	- 13

Social/Communication Profile

Recognitory	I	II	III	IV	Tr	V	VI
Recognitory		-					
Simple - Object			-				
- Person			-				
Complex - Object				-			
- Person				-			
Transitional					-		
Coordinated - Person/obj.						-	
Referential gesture						-	
Referential speech						-	

	I	II	III	IV	Tr	V	VI
Symbolic - Behavior request							-
- Information Statement							-
- Information Request							-

Object Permanence

Situation	Trial 1	2	3	4	5	Notes
Stage I.						
1. Following slowly moving object through 180° arc						F P/F P
a. Does not follow object						
b. Follows jerkily through part of arc						
c. Follows smoothly through part of arc						
* d. Follows object smoothly through complete arc						
Other:						
Stage II						F P/F P
2. Noticing disappearance of slowly moving object						
a. Does not follow to point of disappearance						
b. Loses interest as soon as object disappears						
* c. Lingers with glance on point of disappearance						
d. Searches around point of disappearance						
Other						
Stage III						F P/F P 3A - Random alternation 3B - Sequential displacement
3. Partially covered object						
a. Loses interest						
b. Reacts to loss, but does not obtain object						
* c. Obtains object						
Other						

Situation	Trial 1	2	3	4	5	Notes
4. Looks for reappearance of slowly moving object						F P/F P
a. Does not follow to point of disappearance						
b. Loses interest as soon as object disappears						
* c. Returns glance to starting point after several presentations						
d. Searches around point of disappearance						
Other						
5. Single Visible Displacement						Precursor: Cover a stationary object. F P/F P
a. Loses interest						
b. Reacts to loss, but does not obtain object						
c. Pulls screen, but not enough to obtain object						
* d. Pulls screen off and obtains object						
Other						
Stage IV	R	R	L	L	R	Pass - Right and left
6. Single Visible Displacement, Random alternation						F P/F P
a. Loses interest						
b. Searches under screen where previously found						
c. Searches haphazardly under one or both screens						
* d. Searches directly under correct screen						
Other						
7. Visible Sequential Displacement, Two Screens	R-L	R-L	L-R	L-R	R-L	Emerging - one direction only Pass both direction 6A - Three screens (more difficult) F P/F P
a. Does not follow successive hidings						
b. Searches only under the first screen						
c. Searches under screen where object was previously found						
d. Searches haphazardly under all screens						
* e. Searches in order of hiding						
* f. Searches directly under the last screen in path						
	1	2	3	4	5	F P/F P
8. Single Invisible Displacement						
a. Loses interest						

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Situation	1	2	3	4	5	Notes
b. Reacts to loss, does not search						
c. Searches only in E's hand						
* d. Checks E's hand and searches under screen						
* e. Searchs under screen directly						
Other						
Stage V 9. Single invisible displacement, random alternation	R	R	L	L	R	Emerging - placement or screen dependent; pass-right and left. F P/F P
a. Searches only in E's hand						
b. Searches under screen, where previously found						
c. Searches haphazardly under screen						
* d. Searches directly under correct screen						
Other						
10. Sequential Invisible Displacement, Two Screens	R-L	R-L	L-R	L-R	R-L	Emerging - One direction only, pass - both directions F P/F P
a. Searches only in E's hand						
b. Searches only under first screen in the path						
* c. Searches under all screens in the path in the order of hiding						
* d. Searches directly under the last screen in the path						
Other						
11. Sequential Invisible Displacement, three screens	R-M-L	R-M-L	L-M-R	L-M-R	R-M-L	F P/F P
a. Searches only in E's hand						
b. Searches only under first one or two screens in the path.						
* c. Searches under all screens in the path in the order of hiding						
* d. Searches directly under the last screen in the path						
Other						

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		R-M-L	Rpt 10	R-M-L		
12.	Systematic Search, Reverse Order (Sequential Displacement, Three Searches)					Pass - Only if searches from last to first
	a. Searches only under last screen					
	b. Searches haphazardly under all screens					
*	c. Searches systematically from the last screen back to first					
	Other					

MEANS-END

Situation	Trial					Notes
Stage I/II	1	2	3	4	5	
1. Hand-watching (Causality)						F P/F P
a. Hand-watching is not observed.						
*b. Hand-watching is observed.						
Stage II	1	2	3	4	5	Object/Action F P/F P
2. Repeats early motor movement (Causality 2)						1.
a. Shows interest in object						2. 3.
b. Intensifies arm movements and activates occasionally.						4.
* c. Repeats arm movements systematically and keeps object active consistently.						
d. Only tries to grasp object.						
Other						
3. Visually Directed Grasp	1	2	3	4	5	F P/F P
a. Reaches but does not grasp object.						
* b. Grasps object when both hand and object are in view						
Other:						

Situation	Trial					Notes
STAGE III	1	2	3	4	5	
4. Visually Directed Reach						F P/F P
a. Reaches for, but does not grasp object						
b. Grasps object when both hand and object in view						
* c. Grasps object by bringing hand up to object.						
d. Graps object by shaping hand in anticipation of contact with object						
5. Moves to Regain Object	1	2	3	4	5	F P/F P
a. No attempt to retrieve object, continues play.						
b. Indicates desire for object, but does not try to retrieve it						
* c. Moves to regain object and resumes play using it.						
Other:						
STAGE IV	1	2	3	4	5	Transparent F P/F P Opaque F P/F P
6. Removes Barrier to Obtain Object						
a. No interest						
b. Reacts to loss, but does not attempt to retrieve						
c. Touches barriers only, but no further attempt						
d. Moves barrier, but does not retrieve object.						
* e. Hits, knocks, moves, reaches over or around barrier and retrieves object						
Other						
7. Horizontal String	1	2	3	4	5	F P/F P
a. Reaches for the object, ignoring string						
b. Manipulates the string, but does not pull it enough to get object.						

SITUATION	TRIAL					NOTES
	1	2	3	4	5	F P/F P
*c. Pulls string and gets object after demonstration.						
*d. Pulls string and gets object without demonstration						
STAGE V	1	2	3	4	5	
8. Vertical String						F P/F P
a. Indicates desire for object, ignoring the string						
b. Drops string to floor and becomes unhappy						
c. Plays with the string itself						
d. Pulls the string, but not sufficiently to get the object						
*e. Pulls the string and obtains object after demonstration						
*f. Pulls string and obtains object without demonstration						
Other						
9. Use of Support (Pillowcase)						(If 7 and 8, or only 8, are failed, pass=Stage IV) F P/F P
a. Reaches for object on the support						
b. Tries to get object by climbing						
c. Appeals to another person to get the object						
*d. Pulls the support after demonstration						
*e. Pulls with support without demonstration						
10. Understanding Support						Score P only if 9.=Pass (Stage IV if 7 and/or 8 are failed) F P/F P
a. Pulls support expecting to obtain object						
b. Pulls support, but reaches for object at the same time						
*c. Does not pull the support without the object on it						
Other						
11. Stick (Rake) as Means						F P/F P
a. Plays only with stick						
b. Reaches for object, disregarding stick						
c. Plays with stick and object, does not get object closer						
*d. Uses stick to get object after demonstration						
*e. Uses stick to get object without demonstration						
Other						

SITUATION	TRIAL					NOTES		
STAGE VI	1	2	3	4	5	F	P/F	P
12. Foresight with Necklace and Container								
a. Does not try to put necklace into container								
b. Attempts to put necklace into container, but fails repeatedly								
c. Succeeds in putting necklace in after several unsuccessful attempts (hindsight)								
d. Invents a method which is successful after a failure (hindsight)								
*e. Adopts a method which is successful from the first								
Other								
13. Foresight with Solid Ring						F	P/F	P
a. Does not stack rings								
b. Uses force in trying to stack solid ring repeatedly								
c. Attempts to stack solid ring once and avoids it subsequently (hindsight)								
*d. Sets aside the solid ring without attempting to stack it								
Other								

CAUSALITY

SITUATION	TRIAL					NOTES		
STAGE I/II	1	2	3	4	5	F	P/F	P
1. Handwatching (means-end, 1)								
a. Hand-watching is not observed								
*b. Hand-watching is observed								
Other								
STAGE II								
2. Repeats Early Motor Movements (Means-end, 2)						F	P/F	P
a. Shows interest in object								
b. Intensifies arm movements and activates occasionally								
*c. Repeats arm movements systematically and keeps object active consistently								
d. Only tries to grasp object								
Other								

		1	2	3	4	5	
STAGE III							
3.	Specific Action as Procedure						F P/F P Spectacle/Procedure
	a. Shows interest only during spectacle						1.
	b. Show excitement, but no dominant act during pauses						2.
	*c. A dominant act during pauses suggests a procedure						3.
	d. Reaches for object only						
	Other						
4.	Manual Activated Object; Touch Object						Action should be too difficult for child tc perform F P/F P
	a. Shows interest only during spectacle						1.
(3)	b. A dominant act suggests a procedure						
	*c. Touches object (or E.) and waits						2.
(2)	d. Attempts to activate object with repeated early motor movement						3.
(5)	e. Manually performs action with toy						
STAGE IV							
5.	Manual Activation Objects - Manual Activation						F P/F P Manual toys
	a. Shows interest during spectacle						1. Music box
(3)	b. A dominant act suggests a procedure						2. Push top
(4)	c. Touches object (or E.) and waits						
	d. Attempts to activate action with toy object						3. Closed jar
	*e. Manually activates object						
(7)	f. Gives object back to E.						
6.	Mechanical Activation Objects - Manual Activation						
	a. Plays with object only						F P/F P
	*b. Makes object perform its activity manually						
(4)	c. Touches object (or E.) and waits						
STAGE V							
7.	e. Gives object back to E.						F P/F P
8.	f. Attempts to activate object after demonstration						F P/F P

SITUATION	TRIAL					NOTES		
STAGE VI	1	2	3	4	5			
9. g. Attempts to discover a way to activate object mechanically before demonstration						F	P/F	P

6-9 NOTES

Mechanical toys:

1.

2.

3.

4.

5.

SPATIAL RELATIONS

STAGE II	1	2	3	4	5	F	P/F	P
1. Observe Two Objects Alternately								
a. Looks at one object only								
*b. Alternates glance slowly between objects								
*c. Alternates glance rapidly between objects								
Other								
2. Localizing an Object By Its Sound	R	L	R			F	P/F	P
a. Does not turn to sound								
b. Turns to sound in one direction only								
c. Turns to sound, does not locate its source								
*d. Localizes the source of sound visually								
Other								

SITUATION	TRIAL					NOTES
STAGE III						
3. Following Rapidly Moving Object	R	L	R			F P/F P
a. Does not follow object, continues to look at E's hand						
b. Follows some, but does not locate object						
*c. Follows object and locates it visually only when it lands in view						
d. Searches with the eyes for object when it lands out of view, but does not lean						
Other						Emerging -looks to one side only. Pass-looks both sides
4. Looks for Object Dropped From View	R	L	R			F P/F P
a. Does not follow object, continues to look at E's hand						
b. Follows some, but does not locate object						
c. Searches with the eyes for object when it lands out of view, but does not lean						
*d. Leans to search for object in the direction where it must have landed						
5. Recognizing Reverse Side of Objects	1	2	3	4	5	F P/F P
a. Grasps object with no sign of appreciation of reversal						Objects: 1.
b. Withdraws hand and appears surprised at reversal						2.
*c. Grasps object, but turns it around immediately or by comparing both sides indicates appreciation of reversal						3.
Other:						
STAGE IV						
6. Container and Contained	1	2	3	4	5	F P/F P
a. Does not put objects in; only touches those inside						
*b. Takes objects out, does not put any in						
7. c. Puts objects in and takes them out, one by one						F P/F P
STAGE V						
8. d. Puts or drops objects in, reverses container to get them out						F P/F P

SITUATION	TRIAL					NOTES		
9. Stacking Blocks	1	2	3	4	5	F	P/F	P
a. Does not try to build tower								
*b. Approximates two objects, but does not leave the second on the first (end Stage III)								
*c. Builds a tower of at least two objects								
Other								
10. Appreciates Gravity with Incline Plane						F	P/F	P
a. Does not attempt action.								
b. Manually guides object								
*c. Releases object on incline								
Other:								
11. Makes Detours to Retrieve an Object						F	P/F	P
a. Loses interest in objects								
b. Attempts to reach for the object using the same path as object								
*c. Goes directly around the barrier, thus making a detour								
STAGE VI								
12. Indicates Absence of Familiar Persons						F	P/F	P
a. Does not comprehend question								
b. Goes to the usual location of the person								
*c. Indicates knowledge of absence by gesture or word								
Other:								

SCHEMES

Schemes	Objects								Notes Enter actions with objects during administration of subscales as well as objects specifically presented for scheme assessment		
	1	2	3	4	5	6	7	8			
STAGE I/II											
1. Incidental Uses									F	P/F	P
a. Hold object over 30 seconds											
b. Bring object to mouth											

Scheme	Objects								Notes
	1	2	3	4	5	6	7	8	
STAGE II									F P/F P
2. Visually Inspects									
(Briefly holds and looks at object)									
3. Systematic Use of Simple Schemes									F P/F P
a. Hits or pats with hand									
b. Hits surface with object									
c. Hits two objects together									
d. Alternate transfer									
STAGE III									F P/F P
4. Beginning Differentiation									
a. Shakes object									
b. Waves object									
c. Other									
5. Examines Objects									F P/F P
Examines visually									
Examines manually									
6. Complex Schemes									F P/F P
a. Push object									
b. Roll object									
c. Bring to ear									
d. Slide object									
e. Crumple object									
f. Swing object									
g. Attempt to tear									
h. Stretch object									
7. Letting Go									F P/F P
a. Drop repeatedly and intentionally									
b. Throw object									

Schemes	Objects				Notes
STAGE IV	1	2	3	4	
8. Functional Use of Single Object with Demonstration					F P/F P
STAGE V					
9. Functional Use of Single Object Without Demonstration					(With demonstration is end Stage IV) F P/F P
Socially Instigated					
a. Pretend drink					
b. Wear					
c. Drive car					
d. Dress					
e. Walk					
f.					
g.					
Functional Use Without Pretend					
a.					
b.					
10. Use of Two Functionally Related Objects Without Demonstration					(With demonstration is end of Stage IV, beginning of Stage V) F P/F P
11. Show objects					F P/F P
12. Name objects					F P/F P
STAGE VI					F P/F P
13. Spontaneous Representational Play					

Vocal Imitation

Situation	Trial 1	2	3	4	5	Notes
Stage I.						
1. Spontaneous Vocalizations						F P/F P
a. Only vocalizes distress sounds.						
*b. Vocalizes (coos) when not distressed.						
Stage II.	1	2	3	4	5	Sounds (cooing): ah-i-ya, eh-uh-e, uh-ah-a; uuh-alia
2. Response to Familiar Vocalizations (coos, etc.)						F P/F P Sounds: 1. 2. 3.
a. Shows no interest						
b. Listens but does not vocalize						
*c. Positive response to infant-like sounds (brighter expression, smiles, mouth movements						
Stage III.	1	2	3	4	5	F P/F P
3. d. Continues vocalization when adult imitates child's spontaneous vocalizations						
4. *e. Vocalizes in response, may or may not be similar						F P/F P
Stage IV	1	2	3	4	5	
5. Response to Familiar Sound Pattern (babbling)						Sounds (babbling): ba-ba-ba, at-da-da, ma-ma-ma, etc.
a. Shows no interest						F P/F P
b. Listens, does not vocalize						Sounds:
(2) c. Positive response, does not vocalize						1. 2. 3.
*d. Vocalizes in response, but not same sounds						
6. e. Vocalize similar sound patterns but does not match adult's sounds						F P/F P
*f. Vocalizes similar sound patterns and shifts to match adult's sounds						

Situation	Trial 1	2	3	4	5	Notes
Stage V						Sounds: brr, zzz, ree-ree-ree, faa-faa, etc. F P/F P Sounds: 1. 2. 3.
7. Imitation of Unfamiliar Sound Patterns						
a. Shows unhappiness or cries						
b. Shows no interest						
c. Listens, does not vocalize						
*d. Vocalizes in response with gradual closer approximations						
8. *e. Vocalizes in response with gradual closer approximations						F P/F P
9. *f. Imitates similar sounds immediately						F P/F P
10. Imitation of Familiar Words						Sounds: words and word-like sounds already in repertoire. F P/F P Words: 1. 2. 3.
a. Listens, does not vocalize						
b. Vocalizes in response, but not similar sounds						
*c. Imitates several familiar words.						
11. Imitation of New Words						Words: fish, flower, bus, young, blond, pretty, red, blue, bouncy, etc. F P/F P Words: 1. 2. 3. 4. 5.
a. Listens, does not vocalize						
(8) b. Vocalizes, but not similar sounds						
*c. Vocalizes with gradually closer approximation						
12. d. Imitates a few (1-2) simple new words directly						F P/F P
*e. Imitates practically all simple new words directly (at least five)						

Gestural Imitation

Situation	Trial 1	2	3	4	5	Notes
Stage II						Movements: Schemes in child's repertoire which occur in isolation; e.g., hit object, wave arm, turn wrist. With objects: F P/F P Without objects: F P/F P Movements: 1. 2. 3.
1. Systematic Imitation of Familiar Simple Schemes (Familiar Visible)						
a. Shows interest, but no attempt to imitate						
b. Performs some action consistently, does not imitate						

Situation	Trial					Notes
	1	2	3	4	5	
Stage III						
2. *c. Repeats movement, if adult imitates child's spontaneous movement						F P/F P
3. *d. Imitates movement (imitates familiar visible)						F P/F P
4. Imitation of Complex Actions Composed of Familiar Schemes (Familiar Visible Expansion)						Actions: Expand familiar schemes already in child's repertoite, e.g., hitting blocks together, shaking-shake block in cup, etc. F P/F P Actions: 1. 2. 3.
a. Attends, but makes no attempt to imitate						
b. Performs some action consistently, does not imitate						
*c. Attempts to imitate, but does not approximate on successive attempts.						
Stage IV						
5. *d. Imitates by gradual approximation						F P/F P
6. *e. Imitates expansion immediately.						F P/F P
7. Imitation of Familiar Invisible Gestures						Gestures: Invisible actions already in child's repertoire, e.g., stick tongue out, finger in mouth, etc. F P/F P Gestures: 1. 2. 3.
a. Shows interest, but no attempt to imitate						
b. Performs some action, does not imitate						
*c. Performs correct action on similar but incorrect body part						
*d. Performs similar but incorrect action on correct body part						
e. Other						
8. Imitation of Unfamiliar Visible Gestures						Gestures: Visible actions not in child's repertoire and not taught to child, e.g., open/close fist, bend/straighten index finger, scratch surface, clasp hands, etc. With objects: F P/F P Without objects: F P/F P Gestures: 1. 2. 3.
a. Shows interest, but no attempt to imitate						
b. Performs some action, but does not approximate on successive attempts.						
c. Attempts to perform action on adult						
*d. Imitates by gradual approximation						
9. *e. Imitates immediately						With objects: F P/F P Without objects: F P/F P

Situation	Trial					Notes
	1	2	3	4	5	
Stage V						
10. Imitation of Unfamiliar Invisible Gestures						Gestures: Invisible actions not in child's repertoire and not taught to child, e.g., open/close mouth, blink eyes, pat head, pat cheek, pull ear lobe, wrinkle nose. F P/F P Gestures: 1. 2.
a. Shows interest, but no attempt to imitate						
*b. Performs some action consistently, does not imitate						
11. c. Imitates by gradual approximation						F P/F P 3. 4.
*d. Imitates at least one facial invisible gesture immediately						
13. *e. Imitates several invisible gestures immediately						F P/F P 5.
12. Imitation of Complex Movements (Two Familiar Movements Combined)						Actions: Combine two movements already in child's repertoire; e.g., clap and hit table, hit knees and hit stomach, etc. F P/F P Actions: 1. 2. 3.
a. Shows interest, but no attempt to imitate						
b. Performs some action, but does not imitate						
c. Performs action on adult						
*d. Imitates first movement only						
*e. Imitates second movement only						
*f. Imitates by gradual approximation or approximates both movements						
Stage VI 14. Imitation of Complex New Movements						Movements: Unfamiliar complex; e.g., pat upper arms with arms crossed, put arms above or behind head, etc. F P/F P Movements: 1. 2. 3.
a. Shows interest, but no attempt to imitate						
b. Performs some action, but does not imitate						
c. Imitates by gradual approximation						
*d. Imitates immediately						
15. Deferred Imitation (Model Not Present)						F P/F P
a. Performs action only when model is present and immediately after model						
*b. Performs action at a later time when model is not present						
c. Other						

Name/ID ____________________

School ____________________

Assessor ____________________

Reliability ____________________

Date ____________________

Birthdate ____________________

C.A. ____________________

SOCIAL/COMMUNICATION CHECKLIST

STAGE (0=Absent; +=Observed)	S/C TASKS				S-M
	1	2	3	Tot	
I.					
II. Recognitory					
Consummatory					
III. Simple Object/Simple Person					
Simple Object					
Look at object					
Reach toward object					
Pull at obstructed object					
Cause spectacle (simple)					
Push away object					
Avoid object					
Vocal protest					
Simple Person					
Look at person					
Nonstandard gesture					
Avoid person					
Vocal protest					
IV. Complex Object/Complex Person					
Complex Object					
Look at object and vocalize					
Go to location and wait					
Attack barrier/obstacle					
Cause Spectacle (manual)					

ID # ____________ -2

STAGE	SC TASKS				S-M
	1	2	3	Tot.	
Complex Person					
Look at person and vocalize					
Look at person and gesture					
Touch adult's hand					
Pull adult's body part (obstacle)					
Standard gesture to enstate action					
Give object on request					
TRANSITIONAL IV to V					
Push adult's hand toward					
Put object near adult					
Give to get rid of					
V. Coordinate Object and Person					
Physical (Adult and Object)					
Lead adult to location					
Adult nearby					
Adult at distance					
Coordinate adult and object					
Places in adult's hand					
Places adult's hand on object					
Brings adult's hand and object together					
Prompts adult					
To act on object					
To bring two objects together					
REFERENTIAL (COORDINATED COMMUNICATION)					
Gesture and look at person and vocalize					
Point					
Nonreferential					
Alternating					
Coordinated					

ID # ______________ -3

STAGE	S/C TASKS				S-M
	1	2	3	Tot.	
Show object					
Phonetically consistent sound (with or without gesture)					
Name (Object/Action)					
VI+ Symbolic Speech Behavior request					
Information statement					
Information request					

Length of Utterances:

1 word ______________

2 words ____________

3 words ____________

4 words ____________

5+ words ____________

Appendix L

Standard Series of Activities

Child:

Teacher:

School:

Date:

Time:

Standard Series of Activities

Of the following four tasks, two will be provided by us and two will be chosen by you. The procedure for carrying out the tasks are as follows:

The tasks are to be administered in the child's usual work area by the teacher or person normally assigned to the child. Any procedures normally used with the child should be continued. These may include, but are not limited to, special procedures for getting, presenting, or putting away tasks as well as interventions in effect for maladaptive or appropriate behaviors. If possible, tasks will be scheduled for times when the child is normally engaged in similar work. The tasks need to be administered in the following order without breaks in between:

While the tasks are being administered, an observer will be recording all of the child's behaviors. Since the coding system requires continual recording of behaviors, the observer will be unable to talk with you during the task presentations. Howev:r, any questions can be discussed before the tasks begin.

Please read the attached instructions carefully.

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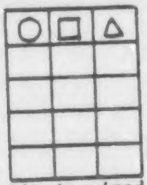
DIFFICULT TASK (PROJECT SUPPLIED)

This task involves a board with 12 partitioned areas and four different shapes and/or colors. The child is to place the forms in the appropriate space. The task is to be carried out in the child's usual work area. Instructions are as follows:

1. Place the board in front of the child with the samples furthest from the child:

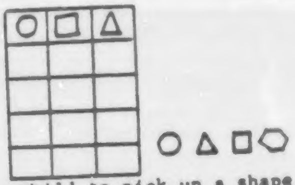


For visually impaired children: Have the child feel the sample shapes from left to right and explore the remainder of the board.

For hearing impaired children: Point to each sample color/shape and then quickly indicate the remainder of the board. Use whatever means of communication you normally use.

For children without visual or hearing impairments: Point to each color/shape in turn, saying "Here are some colors; one here ... here ... and here." Point to the rest of the board, saying "I want you to put colors in here."

2. Place one of each of the four color/shapes on the table to the right of the board, as follows:



Indicate to the child to pick up a shape and place it on the board. DO NOT POINT TO OR GIVE THE CORRECT COLOR/SHAPE.

For visually impaired children: Place the child's hands on the shapes (or one hand on the board and one hand on the shapes). Tell the child to "Put in." If necessary, assist the child to pick up a shape and move his hand in the direction of the board.

For hearing impaired children: Point to the child, then to the shapes, and finally to the board. Any signed or other communication normally used may follow the gestured instructions.

For severely physically handicapped children without grasp and/or release: Instructions should match the type of response of which the child is capable. If pointing or placing the hand is possible, hold up a shape, point to the board with a scanning motion, and ask "Where does this go?" If grasp but not release is possible, assist child to pick up a color/shape, tell child to "Put in" while pointing to the board, have child place his hand on the space he chooses, then remove the color/shape from his hand and place it in the space. If head nodding

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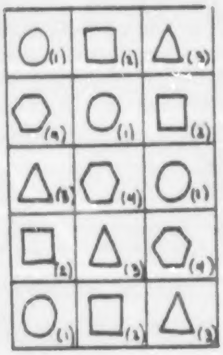
is used, hold up the shape and say "Where does it go?", then point to each shape in turn, asking, "Here? ... Here? ... Here?" If other types of responses are possible, use whatever task presentation strategies you normally use. However, picking up the shapes from left to right (i.e., green circle first) will eliminate unintended cues as to the correct next color/shape.

IF THE CHILD PLACES A COLOR/SHAPE INCORRECTLY, INDICATE HIS RESPONSE WAS INCORRECT AND HAVE HIM TRY AGAIN. Continue this procedure until the color/shape is placed in the correct space. (See key below.)

3. Once all four shapes have been properly placed, present the next set of four. Arrange them as before. If the child places a color/shape incorrectly, again indicate that response is incorrect and tell the child to try again. Continue this procedure until all four color/shapes have been placed correctly.

4. Place the last set of four shapes to the right of the board in the same order as before. Continue same procedure until the board is correctly filled.

Key:



The pattern is a repetition of green circle (1), red square (2), blue triangle (3), and yellow hexagram (4).

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EASIER TASK (PROJECT SUPPLIED)

The following task comprises 15 long, three dimensional blocks and 15 containers. One block is placed upright in each of the 15 containers. The child's task is to remove the rectangular blocks from the containers, one at a time. Any procedure normally used with the child (including prompts) may be used. This task lasts approximately five minutes. Instructions are as follows:

1. Place all fifteen containers with one block in each container on the far left hand corner of the table (to the far left of the child). Place the empty box to the child's right.

Indicate to the child the presence of the rectangular blocks by pointing to them in a sweeping motion, saying "See, we have all these blocks." DO NOT COMMENT ON THE BOX.

For visually impaired: Have child feel the blocks in order to be aware of their presence.

For hearing impaired: Simply point to blocks (and sign if appropriate).

2. Place one container with shape upright in front of the child. (For severely physically involved children the container with block may be placed on its side to enable easier removal.)

Tell child to "Take out" or "Get block" (or similar verbal, signed, gestural, or body signal command that the child understands). If necessary, assist the child to remove the block.

After the child has removed the block, the child may then hold the block, place it on the table, give it to adult, or put it in the box. ALL THAT IS REQUIRED IS THAT THE CHILD INITIALLY REMOVE THE BLOCK. Adult then places the block in the box, picks up the container, and places container to the right of the box.

3. The above procedure is repeated for each of the remaining containers, presenting one container at a time, until all blocks have been removed. The task is finished when no more containers remain in the upper left hand corner and all blocks are in the box.

NONPREFERRED TASK (TEACHER CHOSEN)

Choose one task or activity that the child does not like (i.e., his/her least preferred task or activity). The task or activity should take place in the room in which his usual work area is located. Present the task or activity in the same way you usually do, using the same materials, procedures, instructions, etc. The task or activity should last for about five minutes.

Please briefly describe the task you have chosen:

PREFERRED TASK

Choose one task or activity that the child likes very much (i.e., his/her favorite task or activity). The task or activity must be one that can be carried out in the room in which his usual work area is located. The task or activity does not have to be a table task (although it could be). The task or activity should last for about five minutes.

Present the task or activity in the same was as you usually do, using the same materials, procedures, instructions, etc.

Please describe briefly the task you've chosen in the space below:

Appendix M

CODING SYSTEM FOR SELF-INJURIOUS BEHAVIOR IN THE NATURAL ENVIRONMENT

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DEFINITIONS

Adult Directed Positive Nonverbal Social/Communication

General Definition

Social/communication behaviors are defined as deliberate and discrete behaviors directed toward a person or an object which serve or may be interpreted as serving a communicative function. Behaviors may be in response to an adult behavior or may be an initiation. In order to qualify as social/communicative, a behavior must be: (1) embedded in a "context indicating that a goal desired by the child is operating" (Bates, 1976); (2) a discrete rather than a continuous action; and (3) potentially perceivable by another person (2 and 3 adapted from Guralnick & Weinhouse, 1980). The following categories are based on nonverbal, positive behaviors thought to emerge sequentially within the sensori-motor period of development and include: simple behaviors directed toward objects, simple behaviors directed toward persons, complex behaviors directed toward objects, complex behaviors directed toward persons, transitional behaviors combining objects and persons, coordinated behaviors combining persons and objects, coordinated behaviors involving pointing (referential gestures), and vocalization.

At the level of simple behaviors directed toward objects or toward persons (concept adapted from Sugarman-Bell, 1978), the following additional requirements obtain: (1) the child may look at the desired object or at an adult, but he does not alternate gaze between the two; (2) the child may engage in a motor-gestural or vocal behavior directed toward an object or directed toward an adult, but not directed toward both; (3) behaviors are simple scheme behaviors only; (4) these simple actions are inadequate, in themselves, for achieving the child's goals and either are followed by a pause or involve insistent and persistent attempts; and (5) the action must be interpretable as indicative of the child's desire to obtain a goal, although the child may not be directing his behavior intentionally to an adult.

At the level of complex behaviors (concept adapted from Sugarman-Bell, 1978), the child continues to: (1) look at the desired object or at the adult, but not at both; and (2) engage in an action directed toward an object or a person but not both. However, behaviors are (3) complex schemes which may or may not be adequate for reaching the child's goal, and (4) followed by a pause (waiting for adult response). In addition, (5) behaviors directed toward objects may be interpreted as having communicative intent, whereas behaviors directed toward persons clearly evidence communicative intent.

Transitional behaviors, as the term implies, are intermediate between directing behaviors to persons or objects only and coordinating the two. At this level the child brings an object in proximity of a person, but has not quite mastered coordination of the two.

Coordinated behaviors (concept adapted from Bates, 1976, and Sugarman-Bell, 1978) involve the physical coordination of the adult and an object as a means of specifying what is desired or the use of referential gestures. These behaviors are "accompanied by or immediately preceded or followed by: (1) looking at another person; (2) [vocally] identifying another person [by jargon or phonetically consistent sounds]; or (3) focusing on a common object or activity with another person" (modified from Mueller & Brenner, 1977, by Guralnick & Weinhouse, 1980). The categories of coordinated action on object and referential gestural behavior are also utilized for adult positive, nonverbal behaviors. Vocalization behaviors are non-speech, vocal behaviors. They may be directed toward a person or an object, accompany other nonverbal communication behaviors, or occur alone.

1. Simple Behaviors

Simple scheme behaviors are simple nonstandard bodily movements which do not have universal meanings as gestures or actions on objects which do not involve complex adaptations to the properties of the objects. These behaviors reflect Stage II and III sensori-motor functioning.

a. Simple behavior directed toward an object - Child directs gaze toward object and engages in a nonforceful gestural behavior or action on the object. These may include reaching toward the object with arm and fingers outstretched, pulling at the object, nonforcefully pushing an object away, briefly acting on the object via a simple scheme behavior (e.g., batting, shaking, banging, hitting, etc.), or engaging in a nonstandard gestural behavior (e.g., hitting table while looking at toy). To qualify as social/communicative as opposed to play, action on the object must pose some difficulty for the child such that an adult response is needed; e.g., the object is out of reach, obstructed in some way, or beyond the capability of the child to activate. In addition, actions on objects and nonstandard gestures must be brief and followed by a pausem whereas attempts to attain out of reach or obstructed objects may be continuous.

b. Simple behavior directed toward a person - Child directs gaze or body position toward person and engages in a simple motor-gestural behavior. These may include nonstandard gestures (such as moving limbs, bouncing in rocker, etc.) to cause an adult to activate an object or engage in a behavior without an object, reaching toward an adult, or nonforcefully pushing adult's hand away. As with simple behavior directed toward objects, nonstandard gestures directed toward persons are brief, whereas reaching behaviors are continuous.

2. Complex Behaviors

Complex behaviors are gestures directed toward persons which serve as signals or have universal meanings or actions on objects which involve adaptations to the properties of objects (although not necessarily functional use). These behaviors reflect Stage IV sensori-motor functioning.

a. Complex behavior directed toward an object - Child directs gaze toward object and engages in a nonforceful motor-gestural behavior or action on an object in order to attain a desired object, activate a spectacle, cause an event to occur, or terminate an activity. That is, one behavior is engaged in as a means to a second behavior or goal. Behaviors include abbreviated reaching toward a desired object, pulling at an obstacle, manually activating an object, attempting to open a container, putting an object away (to get rid of object), etc. As with simple behaviors directed toward objects, to qualify as social/communicative, the attainment of the desired object, spectacle, or goal must pose some problem for the child such that adult assistance or response is needed. Not included are continuous actions on objects.

b. Complex behavior directed toward a person - Child directs gaze toward person and engages in a standard gestural or physical contact behavior to gain adult's attention or cause adult to engage in a desired behavior. Behaviors include looking at adult and gesturing (lifting arms to be picked up, waving, etc.), touching adult (tugging, touching body part, holding hand), nonforcefully pushing adult's hand away, and engaging in an action as a signal (clap hands for pattycake, etc.). When touching an adult the child does not specify further the behavior being requested of the adult.

3. Transitional Behavior

Child places object near adult's hand or pushes object toward adult's hand without making contact or specifying desired action; i.e., does not actually give object to adult or place adult's hand on object. Not included are showing an object or higher level forms of giving an object (such as returning object by placing it on table next to adult).

4. Coordinated Actions on Objects and Coordinated Communicative Behaviors

Coordinated behaviors involve the physical coordination of an adult with an object to more clearly specify a desired goal and the use of referential gestures. In order to qualify as coordinated, behaviors must occur within one second of each other. A behavior which occurs three seconds or more after a preceding behavior is considered to be a new communicative act.

a. Coordinated behavior combining person and object - Child engages in a nonreferential behavior in which object and person are brought into physical contact.

The communicative function of the behavior is usually protoimperative (a nonverbal behavior request). Behaviors include leading an adult to a desired location or object, placing an adult's hand on an object, giving adult an object, or physically prompting adult to act on an object. Focus of gaze may be the object, the adult, locus of interaction between the two, or alternate between adult and object.

Adult engages in a nonreferential behavior in which object and child are brought into physical contact. Included are leading a child to a location, physically prompting child to interact with materials, giving objects to child, or taking offered objects from child. Also included are behaviors of assisting a child with an object (e.g., helping child place or carry an object) which cannot be coded as visual task presentation behaviors. Not included are behaviors coded under physical contact or visual task presentation.

b. Referential gestural behavior - Child engages in a motor-gestural behavior or action on object which serves a referencing (i.e., indicating) function. Behaviors include pointing, showing (holding an object to show to adult), and pantomime or pretend behaviors.

Adult engages in a motor-gestural behavior without objects which serves a referencing function. Such behaviors without objects include pointing, descriptive gesturing, holding hand out to be given an object, pantomime, pretend actions, etc. Referential actions with objects are coded as visual task presentation (e.g., moving materials as locational prompts, hold up objects to show, pretend actions with materials, etc.).

5. Vocalization

Child engages in "a nondistress vocal sound or series of sounds which are not distinguishable as words" (Weinhouse & Guralnick, 1980). Included are cooing, babbling, jargon, phonetically consistent sounds, and laughing. Not included are self-stimulatory vocalizations (code as self-stimulation).

Negative/Manipulative Nonverbal Behavior

General Definition

Negative/manipulsive behaviors include negative social/communicative as well as maladaptive behaviors. Behaviors are categorized by type of behavior; i.e., involving gestures, action on objects, physical contact, or vocalization. By definition, behaviors are discrete acts which are directed toward persons or toward objects and may be an initiation or in response to an adult behavior. Negative/manipulative behaviors are negativistic, noncompliant, or aggressive, and serve such functions as avoidance, rejection, opposition, resistance, protest, or expression of displeasure or frustration. The categories of negative action on object and negative physical contact are also utilized for adult negative, nonverbal behaviors.

1. Negative Motor-Gestural Behaviors

Child engages in a motor movement which serves one of the above functions and which does not involve destructive action on an object or negative physical contact directed toward an adult. Behaviors include attempts to move body part away from adult or adult presented object (e.g., turn head or upper torso away, arch back, run away, attempt to get off chair or stand up, pull away from adult, crawl over furniture to get away, etc.); attempts to refuse, reject, or resist adult actions or adult presented objects (purse lips, become rigid, sit on floor or fall limp, shake head "no", etc.); expressions of frustration (bounce up and down in chair, hit self in non-SIB manner, etc.); withdrawal behaviors (put head on desk, cover face with hands, etc.); intentionally oppositional behaviors (do the opposite of what was requested or forbidden); and other negativistic behaviors (e.g., spitting).

2. Negative or Destructive Actions on Objects

Child engages in an action on an object which serves one of the above functions. Behaviors include destructive actions toward objects (tearing objects or clothing, pushing over furniture, biting objects, etc.); attempts to get rid of objects (throwing objects, knocking objects off surface, forcefully pushing objects away); protest or frustration behaviors (banging objects on table, etc.); attempts to get or retain unoffered objects (grab objects, clutch objects); and attempts to remove own clothing (remove shirt, pull down pants, take off shoes or socks, etc.). Gaze may or may not be directed toward adult or object. Not included are quasi-destructive behaviors which are part of child's play behavior; e.g., dropping, banging, or tearing objects as part of play.

Adult removes an unoffered object from child's grasp or possession, usually as a negative consequence and/or without first requesting the child give the object.

Negative Physical Contact

Child engages in an aggressive act directed toward an adult which involves forceful physical contact with body or objects. Behaviors include attempts to injure adult (scratch, pinch, dig nails in, bite, hit, or kick adult or pull adult's hair); physical contact in order to get rid of adult or stop adult's action (forcefully pushing adult body part or adult away, pry adult's fingers open); aggression toward adult's clothing (pull, grab, or tear adult's clothing); and aggressive actions with objects (hit adult with object or throw object at an adult).

Adult engages in aggressive act toward child involving forceful physical contact with or without object.. Included are hitting child, bringing child's arm down sharply, positive practice over-correction procedures, floor restraint, facial screening, etc. Also included is administration of an aversive substance such as electrical shock, ammonia capsule, tabasco sauce, water squirt, etc.

4. Negative Vocalization

Child engages in a negative vocalization which is not distinguishable as a word, including fussing, whining, crying, screaming, and wailing (modified from Guralnick & Weinhouse, 1980).

Child and Adult Symbolic Social/Communication

General Definition

Symbolic communication includes vocal behavior (speech acts) which is minimally a one word utterance and gestural behavior (universal signs) which is clearly signing. To be coded as social/communication, these behaviors must be discrete, directed toward a person, and potentially perceivable by the person. To qualify as being directed to another person, the behavior must be "accompanied by or immediately preceded or followed by: (1) looking at another person; (2) identifying another person verbally [or through signing]; or (3) focusing on a common object or activity with another person" (modified from Mueller & Brenner, 1977, by Guralnick & Weinhouse, 1980). Verbal behavior must be minimally a one word utterance and signed behavior must be universal signs and not simply descriptive gesturing. Behavior must also be intelligible to observers and appear to have a communicative function. Self-verbalization or other verbalizations without communicative intent (e.g., self-stimulatory or echolalic verbalizations) are not included. Speech or signing which is imitative is included.

1. Positive Symbolic Social/Communication

The definitions of behavior request, information statement, and information request were derived by Guralnick, 1978, from Nelson, 1973, and Mahoney and Seeley, 1976.

a. Behavior request - Any verbal utterance that consists of directions, instructions, demands, or clear suggestions. To be counted as such, the utterance must contain a request for the person to respond immediately either motorically or verbally. Examples include: "Put it over there," "Come here," "Robert" (meaning "Look"). Also included are "I want" statements to the other person that require an immediate response and modified imperatives with a question form such as, "Why don't you close the door?" or "Will you stop it?" Any modified imperative that clearly implies a behavior request is so categorized.

b. Information statement - Verbal utterances used for the purpose of mutual information exchange or for interactions relevant to the interaction. They consist of utterances that provide information or description or comments relevant to the interaction. The utterances can be instructional or noninstructional in nature. Utterances directed to the toy, or spoken in the role of the toy, are counted as informational statements. Exclude praise statements (see positive reinforcement).

c. Information request - Verbal utterances judged as questions due to rising intonation or grammatical structure. Modified imperatives with a question form such as "Why don't you do it?" are not information requests. Questions posed in a role playing situation, directed to and requiring an answer from the companion who may also be in the role of a toy, are counted as information requests.

d. Speech - Any verbal utterance that is clearly one or more words and is unintelligible or inaudible to observers or cannot readily be coded as one of the above speech acts (modified from Guralnick & Weinhouse, 1980).

e. Sign - Any gestural behavior that is clearly a universal sign or physical contact behavior which has been trained as a body sign (a sign combined with physical contact). Not included are descriptive gestures or other physical contact behaviors. This category is coded for any signed behavior instead of one of the speech acts (instead of behavior request, information statement, or information request). When both speech and sign occur concurrently, both categories are coded.

2. Negative Symbolic Social/Communication

Negative symbolic social/communication behaviors are verbal and/or signed behaviors accompanied by negative intonation or comprising negative content. These behaviors are divided into two categories, negative behavior request and negative information statement or request, and are coded for both child and adult.

a. Negative behavior request - Any verbal utterance that consists of directions, instructions, demands, or clear suggestions and is characterized by at least one of the following: "(1) immediate compliance is demanded; (2) aversive consequences are implicitly or actually threatened if compliance is not immediate; and (3) sarcasm or humiliation is directed toward the receiver" (Reid, 1978). "I want" statements and modified imperatives with question form, when accompanied by negative intonation or content are also included. Demands for immediate compliance include, "Mine!", "Stop that!", "Teacher!", "Give me that!", etc. Warnings include, "If you do that one more time ...", etc. Behavior requests involving sarcasm or humiliation include, "Stop acting like a baby," etc.

b. Negative information statements and information requests - Verbal utterances that provide information or description or consist of questions and that are accompanied by negative intonation or negative content. Included are threats phrased as statements or questions ("I'm gonna poke my eye," "Do you want me to hold your wrists?"); derogatory comments implying disapproval, criticism, or insult ("That's wrong," "I can't stand having you around," "You're stupid"); manipulative statements ("I'm sick, my knee hurts, my throat hurts ...", etc.); and strong refusals ("No, you can't have that," etc.). Not included are statements with negative content that are simply answers to questions (e.g., answering "no" to the question, "Do you want an orange?").

Other First-Order Events and Behaviors

General Definitions

The following events and behaviors, in addition to the preceding positive and negative social/communicative and manipulative behaviors, are thought to be probable antecedents and/or consequents to SIB. However, they may also occur at times when SIB is not exhibited. The following requirements for coding of other events and behaviors obtain: The behavior or event must be (1) a discrete occurrence rather than a continuous behavior or event, and (2) perceivable by the child. In addition, behaviors and events do not have to be intentionally directed to a child or an adult. Categories include environmental events, adult behaviors, and child behaviors as follows: environmental stimuli (environmental events which are accidental or are not intentionally directed to the child), adult-peer interaction (adult interaction with or attention to other children), adult proximity (adult approaches or leaves vicinity of the child), adult physical contact (physical contact directed by adult to the child), task presentation variables (adult manipulation of task materials), task performance variables (correct, approximation, and error responses by the child), other child behaviors (child actions not included in other categories), positive reinforcement (adult administered positive reinforcement), ignore (deliberate or intentional nonresponse to an adult or child initiated behavior), and restraint (adult or child initiated or terminated physical restraint).

1. Environmental Stimuli

Environmental stimuli are auditory, tactile, or visual stimuli which are not directed by a person to the child; i.e., discrete, fortuitous events which are perceivable by the child and not codable under any of the preceding or following categories. Since environmental stimuli are continually occurring, these events are coded only when the child engages in some observable behavior immediately preceding, concurrent with, or following the environmental stimuli. Where stimuli are perceivable in more than one modality concurrently, both modalities are coded.

a. Auditory environmental stimuli - Any discrete sound in the environment, not directed to the child, such as that emanating from another child's action on a toy, a dropped object, a child crying, a sound producing event in an adjacent room, a musical instrument, a P.A. system, a telephone, etc. Also included are child or adult verbalizations which are not directed to the child. Auditory environmental stimuli are usually loud or unexpected sounds.

b. Tactile or kinethetic environmental stimuli - Any tactile or kinethetic stimuli accidentally encountered by a child and not arising from his own action and which results in his experiencing an unexpected change in texture or movement. Included are tactile or kinesthetic stimuli accidentally caused by another person, such as a person bumping into child, another child bouncing on trampoline while child is on trampoline, a thrown ball hitting child, etc. Not included are tactile or kinesthetic stimuli resulting from child's own actions (e.g., physical contact, tactile or kinesthetic task presentation behaviors).

c. Visual environmental stimuli - Any visually perceivable stimuli which is not directed to the child or a result of his own actions on objects and is not codable as one of the subsequent categories. These include behaviors by persons as well as actions of inanimate objects. Examples are an elevator door opening or closing, a door opening in front of the child (opened by someone on the other side of the door), an adult entering or leaving the room, an adult getting out or putting away food or materials, an adult recording child's performance on a clipboard, etc. These visual stimuli may or may not have meaning for the child (e.g., child may or may not expect food, task materials, adult approach, etc.). Not included are behaviors subsumed under adult-peer interaction, adult proximity, or task presentation variables (see categories below).

2. Adult-Peer Interaction

Adult directs attention to a child other than the target child. Adult attention may take the form of instructing, playing with, reprimanding, commenting to, watching, or simply being near other children as well as responding to behaviors of other children directed to him. To be coded, target child must be attending to the adult's interaction with the other child(ren).

3. Adult Proximity

The adult engages in a discrete, gross motor movement which brings the adult closer or further away from the child. Not included are minor adult body movements accompanying task presentation behaviors.

a. Adult approach - Adult directs gaze and moves own body in direction of child (although not necessarily looking at child or intentionally moving in direction of child). Walking in the direction of the child may occur at a distance or may bring adult within three feet of child. However, to code distant behavior child must be attending to adult's behavior; e.g., watching adult enter room and/or walk across room in child's general direction. Behaviors occurring within three feet of child include pulling own chair closer to child, turning upper torso toward child (provided adult was previously turned away from child), etc. Minor motor movements are not included. Turning in the direction of child while at a distance is codable only when the behavior is clearly perceived by child and precedes or follows an overt child behavior.

b. Adult leaves - Adult directs gaze and moves own body in direction away from child (although not necessarily intentionally directing body away from child). As with adult approach, behaviors at a distance must be perceived by child; included are leaving the room, walking in a direction away from the child, etc. Behaviors within three feet of child include walking in direction away from child, moving chair away from child, turning body or upper torso away from child, and directing attention elsewhere.

4. Adult Physical Contact

Adult engages in nonforceful physical contact with the child with or without an object. Included are affectionate behaviors (hugging, patting, rubbing, kissing, holding, stroking hair, etc.), physical prompts not involving objects (e.g., turning child's head, physically prompting a sign, etc.), and caretaking behaviors involving physical contact (wiping child's nose, adjusting child's shirt sleeve, etc.). Not included are physical prompts with materials (see social/communicative behaviors), negative physical contact (see negative/manipulative behaviors), physical restraint behaviors (see 10), or positive reinforcement behaviors (see 8). Body signs or signals are secondarily coded as signs (see symbolic social/communication).

5. Task Presentation Variables

Task presentation variables involve adult manipulation of materials as part of getting, presenting, or putting away task. As with environmental stimuli, these behaviors may occur within the auditory, tactile, or visual modalities. Where more than one modality is presented concurrently, both modalities are coded.

a. Visual task presentation variables - Included are adult behaviors of placing materials on table, rearranging materials, holding materials up to show or create a visual spectacle, getting new materials out, locational prompts with objects, and putting materials away. Not included are getting and putting away materials for another child or adult (code as environmental stimuli - visual).

b. Tactile and kinesthetic presentation variables - For tactile, adult brings a substance or object into contact with child's body part by physically placing the substance or object on child's body part as part of task. Included is tactile stimulation via rubbing child's body part with lotion, material, or vibrator, or pouring water, sand, shaving cream, or styrofoam pieces on child's body part. For kinesthetic, the adult activates movement producing equipment such as swing, spin chair, rocking boat, trampoline, etc.

c. Auditory task presentation variables - Adult causes task materials to sound as by activating a sound making object (e.g., musical toy), hitting hand or object on surface or on another object (as a locational cue), etc.

6. Task Performance Behavior

Task performance behaviors are child behaviors which are attempts to carry out assigned tasks or to comply with other performance related behavior requests by an adult. Performance related behavior requests relate to daily living skill, educational, and classroom routine behaviors. Task performance behavior can be an action on an object, a motor-gestural behavior, a gross motor behavior. Behaviors are coded as correct, approximations, or errors (incorrect). Assignment to one of these three categories is determined by the observor's perception of degree of correctness and not be the adult's acceptance or nonacceptance of the behavior. In instances where the behavior requested by the adult and exhibited by the child is a social/communicative behavior, the applicable social/communicative code should be used with the task performance code listed second. When attempted compliance involves multiple behaviors extending beyond the duration of a behavior act (e.g., putting successive items in a container), each act is coded. Initial compliance with a behavior request must occur within 10 seconds of the behavior request.

Since these categories reflect attempted compliance, behaviors which are not on-task behaviors are not included and should be coded under one of the other behavioral categories, as appropriate. Also not included is compliance that does not involve an overt behavior in response to behavioral control demands by an adult; i.e., cessation of behaviors in response to commands to cease self-injurious, self-stimulatory, or negative/manipulative behaviors. Correct on-task behavior in the absence of an adult is simply coded as "Work," whereas errors are always coded regardless of the presence or absence of adult.

a. Comply correct - Child engages in a task behavior or behavior requested by an adult and the behavior is exactly what is required. Examples include putting a puzzle piece in the correct hole, putting task materials away on the appropriate shelf, engaging in the exact hand position for a requested sign, etc.

b. Comply approximation - Child engages in a task behavior or behavior requested by an adult; however, the behavior involves only partial elements of what was requested. Included are partially correct actions with the correct object, partial execution of a requested behavior, and compliance with only one part of a complex request. Examples include putting a puzzle piece halfway into the correct hold, putting materials near but not exactly where specified, activating an object incorrectly, engaging in a similar (but not exact) hand position for a requested sign, going to the requested location but without the requested object. Approximations may result from inattention or misunderstanding.

c. Comply error - Child engages in a behavior as part of task or in response to an adult request; however, the behavior is incorrect. Included are incorrect actions (dissimilar to that requested) with the correct object, correct actions with an incorrect object, incorrect actions with an incorrect object, and other actions which are dissimilar from that requested. Examples are putting a puzzle piece in an incorrect hold, engaging in a sign other than the one requested (except when child is engaging in a counter behavior request), taking an object out when told to put one in, etc. The source of the child's error is not relevant, i.e., whether due to inattention or incomprehension. However, intentionally oppositional behavior is coded as negative/manipulative behavior. Simply not responding is coded as ignore or no response (see second order behaviors).

7. Other Child Behaviors

This category is designated for discrete, child behaviors, with or without objects, which are not codable under other categories. These actions may or may not occur during tasks and include accidental behaviors (accidentally dropping an object, tripping over or bumping into furniture), intentional acquisition or release of objects (picking up desired objects, spontaneously retrieving dropped objects, putting down desired objects), and other miscellaneous behaviors (e.g., spontaneously standing up or sitting down). Not included are restraining behaviors with objects, self-stimulatory behaviors with or without objects, attending behaviors (observing other persons or spectacles), unoccupied roaming behaviors (walking around room in unfocused manner), or additional behaviors subsumed under other categories.

8. Positive Reinforcement

Adult verbal or signed praise, physical contact, and/or presentation of a preferred edible, object, or activity, usually contingent on appropriate behavior. Includes communicating approval (saying or signing "good work"), giving an edible (juice, M&Ms, etc.), offering a preferred object (baby doll, necklace), activating a spectacle (music), or providing tactile or kinethetic input (spin in chair or net, apply vibrator, pat on back), etc. This category takes precedence over other codes, such as information statement, adult physical contact, and task presentation variables.

9. Ignore

Child deliberately and intentionally does not respond to a behavior directed to him, or adult deliberately and intentionally does not respond to a behavior directed to him by the child. Examples include child continuing to sit without attending to adult or materials following an adult behavior request, and adult intentional nonresponse to child's social/communicative, negative/manipulative, or self-injurious behavior (e.g., attention withdrawal). Also included are instances where it is unclear whether or not the initiated behavior was perceived (adult verbal commands to a hearing impaired child). Directing sustained attention to the adult or task materials takes precedence over ignore.

10. Restraint

This category includes both restraint and blocking procedures. Restraint is nonforcefully holding and maintaining child's body part(s), by physical contact or materials, in a position incompatible with engaging in particular SIBs. Blocking involves use of physical contact or material to provide a buffer between the self-injurious action and the targeted body part. Restraint can be applied by an adult to the child or by the child to himself. Restraint is distinguished from negative physical contact by (1) duration of contact, (2) use of nonforceful contact, and (3) absence of concurrent aversive components. Therefore, interventions which would not be coded as restraint include sharply bringing child's arm down contingent on SIB. positive practice overcorrection, floor restraint, etc.

a. Application of restraint - Adult initiated restraint: Adult holds child's body part to inhibit SIB or blocks completion of SIB with own body part. Adult places a material restraint on child's body part, such as helmet on head, splints on arms, cloth wrapped or tied to body part and/or tied to furniture, mittens on hands, etc. Child initiated restraint: Child holds own hands (only when clearly restraint related), hooks hands or fingers in clothing (e.g., pulls shirt sleeve over hand, wraps hand in shirt, hooks fingers in belt loop), winds object around fingers or hand (e.g., string, cloth), picks up and places objects between fingers (e.g., lint, small objects), hooks hands or fingers around stationary object (e.g., hooks hands around chairs), etc.

b. Release of restraint - Adult terminated restraint: Adult releases own hold on child's body part, removes a material restraint (e.g., takes off helmet, unties cloth) or physically undoes child's self-restraint (unhooks child's fingers or removes restraining objects). Child terminated restraint: Child undoes self-restraint or releases restraining objects (e.g., unhooks hands, puts down objects) or attempts to remove adult applied material restraint (e.g., unstrap or lift helmet, untie cloth). Child terminated self-restraint may be self-initiated or in response to an adult request.

Second-Order Behaviors

General Definition

Second-order behaviors are continuous behaviors as opposed to the discrete occurrences coded in the preceding section. Second-order behaviors are coded only when it is inappropriate to use any of the other codes. Categories include attention (watching or listening to other persons or events), work (engaging in teacher assigned or directed activity), independent and play activity (child initiated or chosen activity), unoccupied behavior, no response (behavior not directed to or perceived by another person), self-stimulation, and transitional behavior (walking during transitions between tasks or between activities).

1. Attention (Watch)

Child looks at or listens to particular persons, activities, or spectacles in the room. To be coded child must direct gaze toward face, head, or body of other person(s); direct gaze toward object or locus of interaction between object and person; visually track person's movements; and/or turn toward source of sound (or if blind, cease preceding activity). Focus of attention may be nearby or at a distance and, if other person(s), need neither acknowledge nor be aware of child's attending behavior. With the exception of attending responses to unexpected stimuli, watching is a sustained, intentional activity. Therefore, watching is distinguished from unoccupied behavior and ignore behavior in that the child is definitely attending to particular persons, events, or materials rather than to anything that happens to occur. Attention may be coded relative to adult social/communication, interaction with peers, task presentation, positive reinforcement, or restraint behaviors as well as environmental stimuli.

Attention is also coded for adult behavior when adult stands or sits within speaking distance of child and observes child's behavior or is at a distance and engages in eye contact with the child. Ignore takes precedence over attention when adult is nearby but intentionally not interacting with the child.

2. Work

Child independently engages in educational, daily living, or classroom routine tasks assigned to him by an adult. Work behavior can be in the presence or absence of an adult, but must be sustained for the majority of the coding interval. Playing with materials in a manner other than that required by the task, simply holding materials, or self-initiated task-like activities are not coded here. Errors and approximations occurring during independent work activity are coded as such.

3. Independent and Play Activity

Child engages in any simple or constructive activity with objects which has not been assigned to him and is not directed by an adult. Included are independent play with objects, actions with objects during work in other than the assigned manner, self-initiated focused but non-play behavior (intentionally walking somewhere, getting a toy, and/or bringing toy to seat or play area), self-initiated work-like or daily living activities (getting broom from closet, going to bathroom, cleaning table), etc. Activity which is initially self-chosen, but subsequently becomes directed by an adult is first coded as independent and then coded as work.

4. Unoccupied

"Child is apparently not playing [working, interaction with another person, or engaging in sustained attending behavior ,] but occupies himself with watching anything of momentary interest. When there is nothing [of interest] taking place, ... he gets on and off chairs, [just stands around, moves around the room in a nonfocused manner] sits in one spot glancing around the room or staring straight ahead, [or holds] an object without attending to it visually" (Parten, 1932). Not included is self-stimulatory behavior with or without objects which should be coded as such. Waiting explicitly or implicitly requested by an adult is also coded as unoccupied.

5. No Response

No response is coded following behaviors that do not require a response or that have not been perceived by the person to whom they were directed. Behaviors not requiring a response include passively allowing physical contact (e.g., allowing tactile stimulation, combing hair), behavior of other persons that is being watched by but is not directed to the child (e.g., adults talk to each other), and child behaviors that are not directed to another person (e.g., child engages in independent activity not observed or commented on by an adult). Behaviors directed to but not perceived by another person are those behaviors exhibited outside the intended recipient's hearing, visual field, or focus of attention. Examples are signing to a person who is looking in another direction, speaking too softly to be heard, engaging in SIB while adult is occupied elsewhere in the room, etc. (Adapted from Reid, 1978, categories of no response and receive.)

6. Self-Stimulatory Behavior

Child engages in "repetitious topographically invariant motor behaviors or action sequences in which reinforcement is not specified or is noncontingent and the performance of which is regarded as pathological" (Schroeder, 1970). Included are self-stimulatory behaviors with or without objects. Examples are repetitive eye pressing (in a visually impaired child), head wagging, body rocking, finger flicking, light gazing, spinning (self or object), head tapping (with or without object), ruminating, etc. Not included are simple scheme behaviors with objects.

7. Transitional Behavior (Walk)

Child walks as part of going to or leaving an adult assigned activity, or adult walks with child as part of transitional behavior. Transitional behavior is coded beginning at the moment the child leaves or is told to leave his work seat (or area, if not seated for activity). Included are walking in order to get materials, carry them to assigned location, approach location of activity, put away materials following termination of activity, and leave activity area. Transitional behavior may occur between tasks within an activity or between activities. Examples include walking through hallway, entering room, approaching work site (e.g., coat rack, table), approaching shelf to get material, carrying materials to table, etc. Not included are walking behaviors that constitute the child's task (such as setting the table), negative motor-gestural behaviors (such as attempting to leave a person or situation), roaming behaviors (code as unoccupied), or adult approach or leave behaviors.

8. Primary Needs Behavior

Child is eating, drinking, urinating, defecating, or sleeping. To code as primary need behavior, child must be engaged actively in the above behaviors. Therefore, not included are sitting at the snack table or holding a utensil without actually eating or drinking, standing in front of or sitting on the toilet seat without actually urinating, lying down without being asleep, etc.

9. Seizure Activity

Child exhibits seizure behavior.

Self-Injurious Behavior

General Definition

Self-injurious behavior (SIB) is defined as repeated contact of one body part with another or contact of body with an object which has caused tissue damage in the past (i.e., reddening, bruising, callousing, infection, or destruction of tissue). SIB is distinguished from other repetitious or potentially harmful behaviors such as self directed SIB (e.g., rumination), self-stimulatory behavior (see category definition), suicidal gestures (single incident attempts to injure self with an object by ingesting pills, burning self, cutting self, etc.), accidental injuries (accidental falls), and habit behaviors (repetitive lip, cuticle, or sore picking). Topographical categories of SIB are head banging, biting self, face hitting, hair pulling, digging/scratching self, knee to head hitting, object to face hitting, kicking self, SIB threats, and other SIB. These behaviors are coded regardless of their intensity.

1. Head Banging

Child makes sharp contact with head and object, such as wall, corner of chair, shelves, floor, or adult's body. Also included is sharp or repetitive contact of head with other body part, such as forearm or lap. Not inlucded are resting head against an object, throwing self backwards without making contact between head and chair, or behavior subsumed under face hitting and knee to head hitting.

2. Biting Self

Child makes contact between open mouth and any part of body, suggesting self-biting. Included are biting finger, palm, wrist, lower or upper arm, etc. Not included are sucking thumb or fingers, rubbing mouth, smelling body parts, etc., except when these behaviors are known to accompany self-biting.

3. Face Hitting

Child makes sharp contact between hand (one or both hands and with open palm or fist) and face (cheek, nose, chin, or skull). Not included are hand presses to face or unusual topographical hand contacts to face such as index finger to chin, ear presses or hits, etc.

4. Hair Pulling

Child grabs handful of hair and pulls or takes hair between fingers and tugs briefly. Not included are movements such as brushing hair from face.

5. Digging/Scratching Self

Child digs nails into body part, scratches body part with nails, or pinches self. Digging self includes digging nails into knuckles, fingers, hand, arm, or other body part. Scratching self entails sharply pulling nails across a body part. Pinching self involves squeezing a small area of skin anywhere on body between fingers. Not included are scratching an itching body part, rubbing a body part (with or without an object), or picking one's nose.

6. Knee to Head Hitting

Child makes contact with head (cheek, nose, chin, forehead, or teeth) and knee in sharp, rapid, or repetitive manner. Also included is putting head between knees and pressing knees together. Not included are resting head in lap or chin on knees.

7. Object to Face Hitting

Child makes sharp contact with object and face (cheek, nose, chin, skull). Not included are rubbing objects against the face or attempting to eat/chew edible or inedible objects.

8. Kicking Self

Child makes sharp contact with heel of one foot and opposite ankle or leg or sharply brings both extended legs together. Not included are crossing ankles or legs.

9. Eye Poking

Child makes sharp contact with thumb or finger and eye. Not included is rubbing eye. Eye pressing, poking, or manipulating may be categorized a priori for a given child as self-stimulatory behavior.

10. SIB Threats

Child raises body part as if to engage in an SIB and holds body part in position without making contact with another body part or object. Not included are nonSIB which happen to involve motor movements which are components of SIB.

11. Other SIB

Child engages in an SIB not codable as one of the preceding categories. Possible behaviors include hitting body parts other than the head (e.g., chest, hip, back), banging knees together or against furniture, using adult's hand to engage in an SIB, ear poking, pressing hand to face (to nose, chin, or cheek), cracking neck (by moving head sharply), hitting index finger or fist to teeth (not biting), etc. This category may also be used when the observer has failed to note the topography of a given SIB.

Activity Conditions

Activity conditions reflect the type of activity to which the child has been assigned by the teacher; e.g., daily living, group, prevocational, gross motor, music, snack, bathroom, transitional, time out, and other (free or unprogrammed) activities. The onset of each activity is coded, and the activity's termination is inferred from the coding of the onset of the next activity. Tasks within an activity condition are specified in longhand. As with activity conditions, termination of a task is indicated by the entry of a new task or a new activity condition. Activity conditions and tasks are determined by teacher assignment and are not influenced by the presence or absence of on-task behavior by the child.

1. Daily Living Activities

Child is expected or told to engage in daily living type activities. These include putting on and taking off coat; dressing and undressing; cleaning (including vacuuming, sweeping, washing tables, washing windows, etc.); preparing, setting table with, or clearing table of snack materials; running errands (taking papers to the office), etc.

2. Group Activities

Child is expected or told to participate in group type activities or is seated within the group. Examples include circle, group games, teacher instruction of group or subgroup, assembly or spectacle events, etc. Not included are music or gross motor activities which might be carried out in a group.

3. Educational Activities

Child is expected to or told to carry out educational type activities. These include table tasks such as puzzles, drawing, sorting, and lacing tasks; imitation tasks without objects; tasks involving educational toys, etc. Also included are adult directed play-like activities where the adult takes over the child's play by instructing the child or directing the child's behavior.

4. Prevocational Activities

Child is expected to or told to perform prevocational tasks. Prevocational tasks are those labeled as such by the teacher (except where another category subsumes the activity) and may be performed within a specially designated prevocational area. Activities include prevocational sorting, assembly, packaging, and disassembly.

5. Gross Motor Activities

Child is expected to or told to engage in gross motor activities or is in a gross motor area (e.g., the gym). Gross motor activities include gym activities, vestibular activities, swimming, outdoor gross motor activities, and exercises. Gross motor or vestibular activities utilized as reinforcement are also included.

6. Music Activities

Child is expected to or told to participate in music activities, is required to remain with the group during music time, or is given music as a reinforcer. Music activities may be individual or group activities. Not included are musical instruments used as table or floor tasks (e.g., as part of object identification, activating toys, imitation tasks, etc.), or free play.

7. Snack

Child is expected to or told to participate in snack or is seated at the snack table. Whether or not the child eats is not relevant to the coding of this activity.

8. Bathroom

Child is expected, told to, or voluntarily engages in behavior in the bathroom. Included are toileting, toothbrushing, face and hand washing, etc. Also included are diapering outside the bathroom. Not included are cleaning activities, such as cleaning sink or mirror, which happen to take place in the bathroom (code as daily living activity).

9. Transitional Activity

Child is expected to or told to engage in transitional activity. Transitional activity involves going from one location to another, getting or putting materials away between activities or tasks, and waiting before or after activities or tasks (at teacher's request).

10. Other Activity

Child is free to engage in any activity or no activity at all. This category refers primarily to scheduled free play time and unprogrammed classroom time. Although the child may choose to engage in one of the above activity categories, his behavior is still coded as Other. If an adult "takes over" the child's play by repeatedly directing the child's behavior, the activity code is changed to one of the above activity categories as appropriate. As with adult assigned activities, the child's play is specified (e.g., swing, puzzle, etc.).

11. Time Out

Time out is coded for adult administered punishments of extended duration that are intentional interventions. Included are prolonged floor restraint, time out as placement in a time out room or chair, extended positive practice or restitutive overcorrection, prolonged attention withdrawal, etc. Not included are brief attention withdrawals, brief negative physical contact consequations, and restraint (unless involving a prolonged punishment component).

OBSERVATION GUIDE

Coding Rules

General Rules

During naturalistic observations, the target child (SIBer) is observed for two consecutive hours (from approximately 9:00 to 11:00 for a full day or morning class and from 1:00 to 3:00 for an afternoon class) on four consecutive days (Monday through Thursday). Observations begin the moment the child enters the school building (after getting off the bus) until the end of the two hours. For standard activities, observations begin as soon as the first task is placed in front of the child and terminate when the last task is removed (approximately 20 minutes duration).

The observer carries a portable tape recorder with ear jack attachment and a clipboard with observation sheets. Initially, both teacher and aides are reassured that no one is being tape recorded. They are also informed that, because the target child will be watched continuously, the observer will be unable to interact with either staff or children during the observation period. Teachers are also requested to maintain the child's schedule as per usual and to act as they normally would. Once observations begin, the observer should follow the child unobtrusively, remaining close enough to see the child's behavior clearly while at the same time being able to scan the rest of the room. Any attempts to interact with the observer must be ignored. Occasionally target children will watch the observer (and are aware of being watched). Appearing to look past the child or at another person is usually sufficient to terminate child's attending to observer.

Interaction between the child and other persons in the room as well as occurrences of and reactions to environmental events are coded on standard observation sheets (modified from Reid, 1978). Each observation sheet is divided into six lines with five 10-second frames per line. Each line equals 50 seconds, and each page equals five minutes. Therefore, 24 sheets are required to complete one naturalistic observation session, and four sheets are needed for one standard activities session. Thirty second intervals are signalled on a pre-recorded tape by consecutive numbers, and 10 second intervals by a sound. Breaks in coding occur every 20 minutes, at which time the prerecorded tape is rewound. Coding recommences as soon as the tape is ready to be replayed.

Numbering System

All persons within the room are assigned observation identification numbers. The target child is always #1; the teacher is #2; all other aides are #3; and peers in the class are collectively #4. Environmental events not visibly attributable to a person are coded as #5. Adults not normally in the room who are momentarily present and special service staff (e.g., gym or music teacher) are coded #8. If two or more persons are responding to the target child at the same time and their responses are identical, code #9. If two persons simultaneously direct different behavior to the target child, the most relevant response is coded. Specifically, first order behaviors take precedence over second order behaviors. Since the target child will occasionally direct behaviors to the observer, the #0 is utilized for observer, whose response is always coded (i.e., IG ignore or NR no response).

Behavior Coding

All discrete target, adult (or peer), and environmental behaviors and events are coded sequentially per 10 second interval. Continuous behaviors are coded once per 10 second interval followed by the appropriate response. Every behavior or event is preceded by the appropriate identification number.

Simultaneous and Contiguous Behaviors

Behaviors or stimuli occurring within one second of each other and directed to the same person or object are defined as belonging to the same behavioral act or environmental event. Behaviors (or stimuli) occurring three seconds or more following a preceding behavior (or stimuli) and/or directed to a different person or object are considered to be a new communicative act or environmental event. New communicative acts comprising first-order behaviors may be emitted by the same person or by the respondent. If no first-order behavior occurs three seconds following a preceding behavior, the respondent's second-order behavior is coded.

Behaviors (by the same person or environmental event) that occur within one second of each other and are subsumed under a single category are coded as that category only. For example, the combination of child looks at object, reaches and pauses (as signal), comprises one communicative act (CO, complex behavior directed to an object). If a behavioral act involves two different first order behaviors or stimulus categories, both categories are coded. For example, if child bites thumb and pulls pants down, code as 1 BS NA (bites self, negative action on object). Similarly, if teacher says, "There it is. Pick it up," code 2 IS BR (information statement, behavior request). Repetitions of the same category within one second of each other are not recorded. For example, if teacher says, "Stop it! Put your arm down," only one NB (negative behavior request) is coded; i.e., 2 NB. No more than two behavior categories can be coded per behavioral act or event. If both a first- and a second-order behavior occur, only the first-order behavior is coded. If two second-order behaviors occur, the most relevant behavior is coded. Similarly, if more than two first-order behavior categories occur simultaneously or within one second, the two most relevant behaviors are coded (see precedence of codes).

Continuous and Recurrent Behaviors

Duration of a behavior cannot be indicated by this system. Therefore, first-order behaviors which continue into the next time frame must be recorded in the same manner as a recurrent behavior. For example, a child crying for 30 consecutive seconds while adults are occupied elsewhere in the room would be coded as:

1NV - 9NR	1NV - 9NR	1NV - 9NR

This coding is identical to the child engaging in three separate fussing or whining behaviors. For ease in recording, sequences repeated on a line can be indicated by

—————————/ after the first sequence has been recorded. The above example would then be recorded as: 1 NV - 9 NR ———/ ———/.

When no first-order behaviors occur during an interval, the predominant second-order target behavior is recorded. For example, the target is watching adult activity in the room for two consecutive intervals. Five seconds into the second interval a loud sound occurs, following which the child face hits. The first interval is coded 1WT - 9NR; the second interval is coded 1WT - 9NR - 5AE - 1FH.

The initiation and termination of restraint are coded as discrete behaviors. However, ongoing restraint is circled for each interval during which the restraint continues to be applied (i.e., as child or adult applied restraint).

The onset of each activity condition is also circled, and the activity's termination is inferred from the circling of the onset of the next activity. Tasks within an activity condition are specified in longhand. As with activity conditions, entry of a new task implies termination of the preceding task.

Precedence of Codes

When more than two behaviors occur simultaneously or within one second of each other, the two most relevant categories are coded. When in doubt, the following rules may be applied:

1. SIBs take precedence over all other codes.
2. First-order behaviors take precedence over second-order behaviors. (First-order behaviors are nonverbal S/C, N/M, Symbolic, Other Events and Behaviors, and SIB. Second-order behaviors are WT, WK, PA, UN, NR, SS, WA, and PB.)
3. All target communication codes (S/C, N/M, Symbolic) take precedence over Other Events and Behaviors, and the developmentally highest target communication behavior takes precedence over a lower level code.
4. Behavior request (BR) takes precedence over IS and IR. IR takes precedence over IS.

5. Within Other Events and Behaviors, obvious antecedents to SIB take precedence over any other events that happen to occur concurrently.
6. Each discrete behavior (or constellation of behaviors that constitute one category or event) can be coded by one category only. Double coding is for two different category behaviors that occur within one second of each other, not for describing one behavior in two ways. The following are exceptions to the double coding rule:
    a. Communication behaviors that are the child's attempt at compliance are additionally coded as CC, AX, or ER when (1) the behavior requested is a communication behavior, and (2) the child's attempt at compliance is a communicative behavior.
    b. Body signals are designated by the combination PC/SN.
    c. Multiple modalities within a given environmental event or task presentation behavior may be coded if no other first-order behavior occurs concurrently.
7. Only one identification number can be used per interaction turn. If two persons (or one person and one environmental event) occur concurrently, the most relevant must be chosen. (The one exception is the use of #9.)
8. Environmental stimuli must be identified by the appropriate perpetrator (2, 3, 8, or 9 for adults; 4, 9 for peers; and 5 for inanimate object). Five is used when no observable person activates an object; e.g., elevator doors, sound caused by a person who cannot be seen or identified with the action (dropping object in another room, P.A. system), etc.

Coding Abbreviations

Child	Adult			Adult Directed Positive Nonverbal Social/Communication
x			SO	Simple object
x			SA	Simple person
x			CO	Complex object
x			CP	Complex person
x			TR	Transitional behavior
x	x		CA	Coordinated behavior combining person and object
x	x		CR	Referential gestural behavior
x			VO	Vocalization
				Negative/Manipulative Nonverbal Behavior
x			NG	Negative motor gestural
x	x		NA	Negative action on object
x	x		NP	Negative physical contact
x			NV	Negative vocalization
				Child and Adult Symbolic Social/Communication
x	x		BR	Behavior request
x	x		IS	Information statement
x	x		IR	Information request
x	x		NB	Negative behavior request
x	x		NI	Negative information statement
x	x		SN	Sign
x	x		SP	Speech
				Other Events and Behaviors
Neither or	x	ES	AE	Auditory environmental stimuli
Neither or	x		TE	Tactile or kinesthetic environmental stimuli
Neither or	x		VE	Visual environmental stimuli
	x		PI	Adult-peer interaction

Child	Adult		Other Events and Behaviors (continued)	
	x		AP	Adult approach
	x		AL	Adult leave
	x		PC	Adult physical contact
	x	TP	VT	Visual task presentation variables
	x		TT	Tactile and kinesthetic task presentation variables
	x		AT	Auditory task presentation variables
x			CC	Comply correct
x		ER	AX	Comply approximation
x			ER	Comply error
x			CB	Other child behaviors
	x		PR	Positive reinforcement
x	x		IG	Ignore
x			RS	Child initiated self-restraint
	x		RA	Adult initiated restraint
x			TS	Child terminated self-restraint
	x		TA	Adult terminated restraint
			Second-Order Behaviors	
x	x		WT	Attention (watch)
x			WK	Work
x			PA	Independent and play activity
x			UN	Unoccupied
x	x		NR	No response
x			SS	Self-stimulation
x	x		WA	Transitional behavior (walk)
x			PN	Primary needs behavior
x			SZ	Seizure activity

Child	Adult	Self-Injurious Behavior	
x		HB	Head banging
x		BS	Biting self
x		FH	Face hitting
x		HP	Hair pulling
x		DS	Dig/scratch self
x		KH	Knee to head hitting
x		OF	Object to face hitting
x		KS	Kick self
x		EP	Eye poke
x		TH	SIB threats
x		SB	Other SIB
		Activity Conditions	
x		DL	Daily living conditions
x		GP	Group activities
x		ED	Educational activities
x		PV	Prevocational tasks
x		GM	Gross motor activities
x		MU	Music activities
x		SN	Snack
x		BA	Bathroom activities
x		TB	Transitional activity
x		OTH	Other activity (free time)
x		TO	Time out

Number Identification

1	Target child
2	Teacher
3	Classroom aides

Number Identification (continued)

4	Peers (other children)
5	Environmental event
6	
7	
8	Momentary person and special service staff
9	Two or more persons simultaneously
0	Observer

DEFINITION EXAMPLES

Adult Directed Positive, Nonverbal Social/Communication

The following descriptions are examples and not exhaustive listings of all possible behaviors subsumed within a category. General categories to be coded are indicated by coding abbreviations in parentheses.

1. Simple Behaviors

   a. Simple behavior directed toward an object (SO)

      1. Anticipatory consummatory behavior - child opens and closes his mouth when adult holds object in front of his face. Mouth movements may be accompanied by attempts to approach the object, including gross motor movements of the body and/or head. Mouthing movement is the action the child would perform on object if he were holding it.

         Example 1: Adult holds spoon with food several inches in front of child's face. Child thrusts her head forward toward the spoon, opening and closing her mouth.

         Not included here are reflexive tongue thrusts that child exhibits noncontingently.

      2. Reach toward object - Child extends arm with fingers outstretched toward an object which is out of reach. Child looks at object while reaching.

         Example 1: Adult suspends bright colored object in front of child just out of child's reach. Child engages in above behavior in unsuccessful attempt to grasp object.

         Not included here are picking up objects as part of play activity or task behaviors.

      3. Pull at obstructed object - Child pulls at object which is held fast by an adult or a physical obstacle. Child does not act on cause of obstruction.

         Example 1: Adult is holding a toy in his hand. Child reaches toward and grasps toy. When adult does not release toy, child pulls toy to obtain it. Adult may or may not release toy.

Example 2: A peer is standing or sitting on a desired object. Child pulls at object without acting on peer.

4. Cause spectacle to occur or reoccur - Child reaches toward an object which has been activated previously (by an adult) and touches the object or performs a simple scheme on the object (e.g., bats at or hits object gently). Child looks at object, but not at adult.

   Example 1: Adult demonstrates a musical apple toy. Child briefly touches object, causing it to emit a sound.

5. Look at object and vocalize - Child directs gaze toward object or locus of interaction between adult and object and vocalizes.

6. Nonstandard gesture - Child looks at an object and engages in a nonstandard motor movement (e.g., leg or arm movement) as if to cause the object to perform its spectacle. These behaviors are insufficient to activate the object.

   Example 1: Child looks at jack-in-the-box or surprise box and hits the table.

   Example 2: Child looks up at mobile and kicks his legs on the floor.

b. Simple behavior directed toward a person (SP)

1. Non-standard gesture - Child looks at or directs body toward adult and engages in a nonstandard motor movement (e.g., leg or arm movement) to cause a spectacle or action to be repeated by an adult. Such behaviors are usually conditioned intentionally or accidentally by the adult's timing in reactivating a spectacle. Child may instigate adult's action with toy by a nonstandard gesture, if this has become an established routine based on prior experiences. Not included are standard components of the interaction, which the child may use to indicate a desire to initiate or resume the activities (see Stage IV).

Example 1: Child moves arms, adult reactivates spectacle (e.g., activates musical toy, shakes object, etc.). This sequence is repeated several times.

Example 2: Adult briefly rocks rocking chair. Child bounces briefly. Adult rocks chair. Child bounces briefly. Adult again rocks chair.

Example 3: Child is sitting on small trampoline with head turned away from teacher. Child turns head and looks at teacher. Teacher bounces trampoline. Child laughs while bouncing. Teacher ceases action. Child pauses, turns head, and looks at teacher. Teacher bounces trampoline. This sequence is repeated several times as child quickly learns the contingent game.

2. Reach toward person - Child directs gaze toward person and extends arm with fingers outstretched to grasp adult.

Example 1: Adult leans over child. Child reaches out and (attempts to) grasps adult's hair or clothing. This behavior is a form of visually directed reach.

Not included is reaching as a gesture (see complex behavior).

2. Complex Behaviors

a. Complex behavior directed toward an object (CO)

1. Abbreviated reach - Child directs gaze toward object (or locus of interaction between adult and object) and extends hand toward object without continuing the reaching action. Behavior may or may not be accompanied by vocalization.

Example 1: Adult is sitting near an object which is out of child's reach. Child looks at object, extends arm toward object (ceasing movement and leaving arm in place as if to indicate).

Not included are referential gestures such as pointing (see coordinated behavior).

2. Goes to location of desired object - Child walks/moves to desired object, looks at object, and waits; e.g., walks to door or water fountain and waits.

3. Attacking a barrier or obstacle - Child touches physical obstacle to get object (e.g., holds, hits, or pulls at inanimate obstacle to get desired object), is unsuccessful, and pauses.

   Example 1: Child stands in front of closed door, looks at door or door knob, holds or pulls at door knob, and pauses. Child does not attempt to gain adult's assistance in opening door knob by directly appealing to adult. Pulling the door knob is here considered to be a means to another goal, i.e., getting out of room.

   Example 2: Child hits screen or object which is placed in front of desired toy and waits.

4. Cause spectacle to occur or reoccur (manually acts on object) - Child unsuccessfully attempts to manually activate a mechanically or manually activated object and pauses, while continuing to focus gaze on object. Included are turning wheel of ferris wheel, attempting to lift up surprise box or jack-in-the-box lids, lifting up on the push top lid, touching knob of music box. Behavior usually (although not always) follows presentation and/or demonstration of activation by adult and is engaged in repeatedly for adult to reactivate object.

   Example 1: Child unsuccessfully attempts to obtain an object visible inside a transparent, tightly closed container by upending container or attempting to remove lid. Child pauses and continues to look at container. (Child does not look at adult or physically prompt adult for assistance.)

   Example 2: Child touches knob of music box, pauses, and continues to look at music box. Adult briefly activates music. Child repeats procedure. (Similarly, child may briefly touch wheel of ferris wheel, lid of surprise box or jack-in-the-box, etc., and wait.)

b. Complex behavior directed toward a person (CP)

1. Look at person plus gesture - Imperative: Child directs gaze toward adult's face or body and extends arms upwards as if to be picked up or extends arms toward adult's face or shoulders with or without physical contact. Declarative: Standard gestures of waving "hi" and "bye" and look at adult plus smile are included here. Pointing is not included.

   Example 1: Adult is on the other side of room from child, who is seated on the floor. Child looks toward adult and extends right arm with open hand in direction of adult.

2. Tugs at adult - Child grasps adult's clothing and tugs at clothing.

3. Gesture to enstate or reinstate action sequence - Imperative: Child engages in action/gesture which is part of activity as signal for specific response or sequence of responses. Declarative: "Showing off" behaviors which adults have previously laughed at would be included here. Child generally looks to adult for reaction.

   Example 1: Child claps hands for adult to play pattycake.

4. Touch/hold adult's hand - Child reaches for adult's hand and touches or holds hand and waits, but does not further specify desired action. (Child may similarly touch adult's face or arm.)

3. Transitional Behavior

a. Push adult's hand in direction of desired object - Child physically moves adult's hand toward desired object without actually placing adult's hand on object.

   Example 1: Child touches or holds adult's hand and nudges or pushes adult's hand toward a desired box of cookies or toy or toward an object with which he wants assistance.

b. Puts object near adult's hand or makes brief contact - Child places object on surface near adult's hand or briefly touches object to adult's hand as a means of requesting assistance but does not actually give object to adult or place adult's hand on object.

Example 1: Examiner demonstrates opening jar, removes piece of candy, closes jar, and hands jar to child. Child unsuccessfully attempts to open jar by shaking it, briefly taps adult's hand with jar (appears almost accidental), then holds jar in lap and waits.

Example 2: Child holds object near adult's body and lets go before adult has a chance to take it.

4. Coordinating Actions on Objects and Coordinated Communicative Behaviors

a. Coordinated behavior combining person and object (CA)

1. Lead adult to location or object - Child takes adult's hand or arm and physically leads adult to desired location or object. This behavior occurs in combination with other communicative behaviors. For example, child may have to first pull/tug at adult to get adult to stand up. When desired location is reached, child may need to specify desired action or object. The types of combinations of behaviors appear to be ordinal in difficulty.

Initiate leading an adult -

Level 1 - Take adult's hand when adult is in physical proximity and lead to desired location.

Level 2 - Approach adult from distance and lead to desired location.

Specifying desired action or object after leading adult to location -

Level 1 - Lead adult to location and stand and wait (e.g., stand in front of door).

Level 2 - Lead adult to location and put own hand on object (e.g., put own hand on door knob).

Level 3 - Lead adult to location and place adult's hand on object. Only the act of taking adult's hand and leading should be coded here. Other codes should be used for additional behavior.

2. Place adult's hand on object - Child takes adult's hand and places it on object, usually to request assistance. As in a1, levels of sophistication appear to exist:

   Level 1: Place adult's hand on object and wait or gives object to adult for assistance.

   Level 2: Take adult's hand with one hand while holding object with the other hand. Child brings adult's hand and object together.

3. Physically prompt adult to act on object - Child physically prompts adult to perform desired action on object by moving adult's arm or hand in relation to object.

   Level 1: Physically prompt action on one object.

   Example 1: Child pushes on adult's hand with his own hand to cause jack to go into box or solid ring to go on stacking post.

   Example 2: Child pushes/nudges adult's hand to get adult to continue filling a balloon with water.

   Level 2: Physically prompt adult to bring two objects together so as to use one object as a tool.

   Example 1: Child holds/pushes adult's hand (which contains a knife) so that the knife moves against label on jar. Intent is for adult to use knife as a tool to remove label from jar.

   Example 2: Child pushes/nudges adult to continue pounding on a poundaround.

4. Give object to adult - Child (attempts to) places an object in adult's hand or lap. Behavior can be in response to adult's request or an initiation. Included are giving an object to request assistance, to

return the object, to comply with adult's request as part of a routine (e.g., after task is completed), and to share.

Example 1: Adult holds out hand as nonverbal gesture. Child places object in adult's hand.

Example 2: Child places jar in adult's hand and waits for adult to open jar.

Example 3: Child extends arm, holds object out to adult, and waits for adult to take object.

b. Coordinated referential gestural behavior (CR)

1. Point to object or person - Child extends arm with index finger outstretched toward a person or object.

Level 1 - Nonreferential point - Child looks at object and points without looking at adult.

Level 2 - Alternating referential point - Child looks at object and points, looks at adult and points, then looks at object and points.

Level 3 - Coordinated referential point - While continuing to point toward object, child looks at object, looks at adult, and then looks at object again.

Point may or may not be accompanied by vocalizing.

2. Show object - Child holds up object to show to or offer to adult. Child does not actually give object to adult. Behavior may or may not be accompanied by vocalization.

3. Pantomime or pretend behavior - Child engages in pantomime or pretend behavior such as pretending to drink, pour, stir, or eat without food being present; gesturing an action; pretending to engage in caretaking activities with a doll; etc. Not included are pretend behaviors prompted by adult which child engages in rotely (without understanding pretend component), bring cup or spoon to mouth in order to drink or eat, or signing.

Sample Coding

The following examples illustrate the use of the behavioral code relative to specific categories.

Adult Directed Positive, Nonverbal Social/Communication

SO - Simple behavior directed toward an object.

Example: Teacher briefly activates a transparent push top on table in front of child (2 VT AT). Child looks at toy and hits table (1SO). Adult reactivates top (2VT AT). As soon as top stops, child again looks at top and hits table again (1 VT AT).

Code:

2 VT - 1 SO	————/
AT	

SA - Simple behavior directed toward a person

Example: Child is seated in rocking chair. Adult rocks the chair (2 TT). As soon as the rocker stops, child looks at adult and vocalizes (1 SP).

Code:

2 TT - 1SA	

CO - Complex behavior directed toward an object.

Example 1: Adult activates musical ferris wheel (2 AT VT). Child manually moves wheel of toy briefly (1 CO). Adult reactivates ferris wheel (2 AT VT), and child again moves wheel (1 CO).

Code:

2 AT - 1 CO	————/
VT	

Example 2: Adult activates ferris wheel (2 AT VT), and child manually moves wheel (1 CO) as above. Adult says, "Turn the knob" (2 BR). Child again manually moves the wheel (1 CO ER).

Code:

2 VT - 1 CO	2 BR - 1 CO
AT	ER

Example 3: Child looks at sandwich, engages in abbreviated reach toward sandwich, hits head with other hand (1 CO FH). Classroom aide brings child's arm down sharply (3 NP).

Code:

1 CO - 3 NP	
FH	

CP - Complex behavior directed toward a person.

Example: Teacher walks in direction of child (2 AP). Child reaches to adult to be picked up (1 CP). Teacher walks past child (2 AL). Child continues to watch teacher.

Code:

2 AP - 1 CP	2 AL - 1 WT

TB - Transitional behavior.

Example 1: Adult hides food beneath a cover (2 VT). Child looks at cover (1 WT). Adult says "Where's the food? Get the food" (2 IR BR). Child takes adult's hand and pushes it in the direction of another container of food (1 TR ER). Adult repeats "Get the food." (2 BR). Child again pushes adult's hand toward incorrect container (1 TR ER).

Code:

2 VT - 1 WT	2 IR - 1 TR	2 BR - 1 TR
	BR ER	ER

Example: Child holds object up to adult and lets go (1 TB). Adult takes/catches the object (CA).

Code:

1 TR - 2 CA	

CA - Coordinated behavior combining person and object.

Example: Child places adult's hand on container (1 CA). Adult opens container (2 VT).

Code:

1 CA - 2 VT	

CN - Coordinated nonreferential behavior. (Deleted from coding system.)

Example: Child throws/drops a toy, looks at adult and says "de" (1 CN). Adult responds with "Yes, you dropped your toy" (2 IS).

Code:

1 CN - 2 IS	

CR - Coordinated referential behavior.

Example 1: Child looks at adult and holds up ball to show (1 CR). Adult says "Oh, you have a ball" (2 IS).

Code:

1 CR - 2 IS	

Example 2: Child looks at adult and points to a toy (1 CR). Adult is not watching child and doesn't see the behavior (2 NR). Child then points and vocalizes (1 CR). Adult looks up and says "Oh, you want your toy" (2 IS).

Code:

1 CR - 2 NR	1 CR - 2 IS

Nonverbal Negative/Manipulative Behavior

NG - Negative motor/gestural behavior.

Example: Adult holds spoon with food cup to child's mouth (2 VT). Child purses mouth and turns head away (NG).

Code:

2 VT - 1 NG	

NA - Negative action on object.

Example: Teacher enters room (2 VE) as child watches (1 WT). Child deliberately throws a toy while looking at adult (1 NA). Adult intentionally turns away from child to ignore the behavior (2 IG). Child then grabs papers off a desk while continuing to look at adult (1 NA). An aide in the classroom comes over, forcefully puts child's arm down and removes papers (2 NP). Child then hits the aide (1 NP).

Code:

2 VE - 1 WT	1 NA - 2 IG	1 NA - 2 NP	1 NP -
		AP	

NP - Negative physical contact.

Example: (continued from above). After the child hits the aide, both teacher and aide attempt to place child in floor restraint (9 NP). Child tries to pull away (1 NG). Adults then successfully, physically place child on floor.

Code:

- 9 NP	1 NG - 9 NP

NV - Negative vocalization.

Example: Teacher has previously hidden food and now says "Find food" (2 BR). Child takes adult's hand and pushes it toward original location of food (place where teacher got it) (1 CR ER). Adult says "No, find food" (2 BR). Child again takes teacher's hand and repeats same action (1 CR ER). Adult again says "No, find food" (2 BR). Child begins to fuss/whine (1 NV).

Code:

2 BR - 1 CR	2 BR - 1 CR	2 BR - 1 NV
ER	ER	

Symbolic Social/Communication

BR - Behavior request.

Example 1:Child approaches adult and says "Cookie" (1 BR). Adult says "We'll have cookies later" (IS).

Code:

1 BR - 2 IS	

Example 2: Child signs (with adult's hand) "Want up" (1 SN). Adult signs (with child's hand) "No, we're sitting" (2 PC/SN IS). Child repeats "Want up" (1 SN). Adult says "No, want sit," signing with child's hand (2 PC/SN BR).

Code:

1 SN - 2 PC/SN	1 SN - 2 PC/SN
IS	BR

IS - Information statement.

Example: Child bounces up and down in chair (1 NG). Adult says, "We're working now" (2 IS). Child hits head with fist (1 FH). Adult intentionally does not respond (2 IG). After several seconds, adult begins to say "we're wor-" (2 IS), and child hits head with fist before adult can finish statement (1 FH).

Code:

1 NG - 2 IS	1 FH - 2 IG	2 IS - 1 FH

IR - Information request.

Example: Adult asks, "Do you want juice?" (2 IR). Child answers, "No" (1 IS).

Code:

2 IR - 1 IS	

NB - Negative behavior request.

Example: Child is sitting, staring off in space. Adult says, "Look" (2 BR). Child continues to stare off in space (1 IG). Adult angrily commands, "You look at me right this minute!" (2 NB). Child rocks his body back and forth (1 SS).

Code:

2 BR - 1 IG	2 NB - 1 SS

NI - Negative information statement.

Example: Adults are standing talking to each other. Child says, "I'm gonna poke my eye" and holds finger up as if to poke (1 NI TH). Adults continue talking to each other (9 NR). Child then knocks over a table (1 NA). One adult says, "If you do that again, you go to time out" (2 NB).

Code:

1 NI - 9 NR	1 NA - 2 NB
TH	

Other First-Order Events and Behaviors

AE - Auditory environmental stimuli.

Example: Child is sitting in a chair watching other children play (1 WT - 4 NR). Someone in the room drops an object, causing a loud sound (5 AE). Child slaps her face (1 FH). Child then resumes watching the children play (1 WT - 4 NR).

Code:

1 WT - NR	5 AE - 1 FH	1 WT - NR

TE - Tactile and kinesthetic environmental stimuli.

Example: Child is sitting on trampoline. Child looks at adult (as nonstandard gesture, 1SP). Adult bounces trampoline (2 TT). Child and adult each repeat same behaviors. Child then flicks hands downward (1 SS). A child nearby jumps on the trampoline, causing it to bounce (4 TE). Child repeats the flicking movement (1 SS). Nothing else happens (9 NR).

Code:

1 SP - 2 TT	————/	1 SS - 4 TE	1 SS - 9 NR

VE - Visual environmental stimuli.

Example: Adult and child are standing in front of door. Adult says, "Open the door" (2 BR). Child just stands there (1 IG). Adult repeats the command and child continues to stand (———/). Adult again says, "Open the door" (2 BR). Child hits his face with hand (1 FH). An adult from another classroom opens the door from the other side (8 VE), and child walks through open doorway (1 WA*).

Code:

2 BR - 1 IG	———/	2 BR - 1 FH	8 VE - 1 WA

* WA could be coded as CB (other child behavior) since it is a discrete behavior.

PI - Adult-peer interaction.

Example: Adult talks with and hugs another child as child watches (2 PI). Target child grabs other child's hair (1 NP). Other child screams (4 NV). Adult forcefully removes target child's hand and says "Sit down!" (2 NP NB). Child grabs adult's hair (1 NP); adult forcefully puts child's arm down (2 NP).

Code:

2 PI - 1 NP	4 NV - 2 NP	1 NP - 2 NP
	NB	

CHILD: ______ CONDITION: ______ OBSERVER: ______ DATE: ______ SCHOOL: ______ PG ___

DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
1			2	
DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
	3			4
DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
		5		
DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
6			7	
DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
	8			9
DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH	DL GP ED PV GM MU SN BA TB OTH
Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS	Task: PC RA RS
T.O.	T.O.	T.O.	T.O.	T.O.
		10		

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CP	Complex person	4
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HP	Hair pulling	24
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KS	Kick self	24
NA	Negative action on object	6
NB	Negative behavior request	9
NG	Negative motor gestural	6
NI	Negative information statement	10
NP	Negative physical contact	7
NR	No response	20
NV	Negative vocalization	7
OF	Object to face hitting	24
PA	Independent and play activity	20
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SN	Sign	9
SO	Simple object	3
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SZ	Seizure activity	22
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UN	Unoccupied	20
VO	Vocalization	5
WA	Walk (transitional behavior, second-order)	21
WK	Work	20
WT	Attention (watch)	19

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Appendix N

PROGRAM CONTACTS AND RESPONSES BY COUNTY

	Program and School Responses			
County	Serve SIBers and agreed to participate	Identified SIBers or referred to programs serving SIBers	Reported Serving No SIBers	No Response
Franklin	Association for the Developmentally Disabled (ADD) Day Care Center Central Ohio Chapter of the National Society for Autistic Children (ACLD) Summer Recreation Program Columbus Public Schools Multihandicapped/Visually Handicapped Program Colrain School Maize School Hearing Handicapped Program Alexander Graham Bell School for the Deaf Diocesan Child Guidance Program Day Treatment Center Family Learning Center Franklin County Board of Mental Retardation and Developmental Disabilities (FCBMR/DD) Early Childhood Education Forest Park School Hometraining Program Kingswood School The Nisonger Center School Age Program Northeast Training Center Northridge School Southeast Training Center The Nisonger Center Applied Behavior Analysis Program West Central Training Center	Bureau of Services for the Blind, District VI Central Ohio Chapter of the National Society for Autistic Children (ACLD) Central Ohio Special Education Regional Resource Center (Region I SERRC) Children's Mental Health Center, Inc. Crippled Children's Center, Outpatient Services Franklin County Board of Education Lutheran Social Services Developmental Disabilities Project North Community Mental Health and Retardation Services of Franklin County Statewide Parent Information Network (SPIN)	Arts for Special Kids, Central Ohio ACLD Bexley City Schools Central Ohio Adolescent Center, Centre School Cerebral Palsy of Columbus and Franklin County, Inc., United Crippled Children's Center, Toddler and Preschool Classes Diocesan Child Guidance Center, Outpatient Services Franklin County Board of Mental Retardation and Developmental Disabilities ARC Industries East ARC Industries West Franklin County Council for Retarded Citizens Hannah Neil Center for Children Huelsman Clinic, Ohio State University Human Resources Center Mental Health Program for the Deaf, Central Ohio Psychiatric Hospital	Action for Children Child and Adolescent Psychiatry Clinic, Ohio State University Hospitals Columbus Area Community Mental Health Center Franklin County Children's Services (refused) Plain Local School District Psychological Clinic, Ohio State University The Bridge of Northland, Inc.

PROGRAM CONTACTS AND RESPONSES BY COUNTY

	Program and School Responses			
County	Serve SIBers and agreed to participate	Identified SIBers or referred to programs serving SIBers	Reported Serving No SIBers	No Response
Franklin (cont.)	Workshops ARC Industries South ARC Industries North, Prevocational Unit Love and Learn Day Care Center Ohio State School for the Blind Deaf/Blind Unit St. Vincent's Children's Center Southside Day Care Center		Muscular Dystrophy Association North Community Mental Health and Retardation Services of Franklin County Day Treatment Program Ohio State School for the Deaf Six-Pence School, Inc. The Childhood League Center The Educational Clinic	
Delaware	Delaware County Mental Retardation Program Hickory Knoll School	Bureau of Services for the Blind, Region VI Central Ohio Special Education Regional Resource Center (Region I, SERRC)	Alpha Industries Central Ohio Mental Health Clinic and Guidance Center Delaware City-County Speech and Hearing Center	Council for Retarded Citizens Delaware County Board of Education Delaware County Welfare Department, Children's Services
Licking	Southwest Licking Local School District	Licking County Board of Education	Granville Exempted Village Infant Development Program of Licking County Johnstown Local School District Lancaster City Board of Education	Heath City Board of Education Lakewood Local School District Leads Head Start Licking County Mental Retardation Program Eleanor S. Weiant Starlight School

PROGRAM CONTACTS AND RESPONSES BY COUNTY

	Program and School Responses			
County	Serve SIBers and agreed to participate	Identified SIBers or referred to programs serving SIBers	Reported Serving No SIBers	No Response
Licking (cont.)				Licking County Services Center Licking Heights Local School District Newark City Board of Education Northfork School District Northridge Local School District Perceptual Developmental Center for Licking County
Marion	Marion County Board of Mental Retardation MARCA Industries MARCA School	North Central Ohio Special Education Resource Center Region 8 SERRC)	Marion City Schools	Easter Seal Society for Crippled Children and Adults of Marion County, Inc. Marion Area Counseling Center Marion Community Action Center Marion County Schools

Appendix O

Tasks Chosen by Teachers for Standard Activities

	Standard Activities			
	Preferred		Nonpreferred	
DL Daily Living Tasks		0		2
Self-care		0		2
27=clean hands/face (BA)	0		2	
84=electric toothbrush	0		(1)	
GP Group Tasks		0		0
None				
ED Educational Tasks		33		21
Standard Activities				
45=difficult task (N=50)	-		-	
46=easy task (N=50)	-		-	
Fine Motor		14		12
Formboards				
3=pegboards	2		3	
9=formboards, puzzles	3		3	
I=graded cylinders	0		1	
Shapes				
47=shape sort	1		0	
69=shape boxes	0		2	
Put in/take out				
C=put in/take out of containers	1		1	
Stacking				
5=stacking rings	3		0	
Stringing				
70=stringing beads	1		0	
Sorting				
4=color sorting	1		0	
8=picture sorting/matching	1		0	
Blocks				
6=blocks, imitation	0		2	
7=blocks, free play	1		0	
Infant/Preschool Causality Toys		6		3
Infant				
12=infant toys	0		1	
Musical				
42=musical toys	2		0	
78=music toy (spin wheels)	1		0	
Nonmusical				
10=games	1		0	
77=surprise box	1		1	
79=cash register	1		1	
Tactile Materials		6		2
15=shaving cream, soap	1		0	
35=vibrator	1		0	
44=tactile materials (styrofoam)	0		1	
86=water play	2		0	
90=olfactory jars	1		0	
95=clay	0		1	
96=air toy	1		0	

	Standard Activities			
	Preferred		Nonpreferred	
Motor Imitation		1		1
83=body part identification	0		1	
H=finger play	1		0	
Workbook		0		2
11=workbooks	0		1	
E=writing	0		1	
Books		1		0
97=magazine	1		0	
Object Permanence		4		1
89=Object permanence - with edibles	4		0	
- without edibles	0		1	
Object Identification		1		0
61=Object discrimination (receptive)	1		0	
PV Prevocational Tasks		7		22
Object Sorting/Matching		2		8
16=two object sorting	0		3	
17=silverware sorting	0		2	
18=objects in partitions; 1:1	1		2	
93=matching dishes (three)	1		0	
94=spoons in outline on silverware tray	0		1	
Packaging		2		7
19=bagging, packaging	2		3	
48=stuffing envelopes	0		2	
82=putting objects in boxes	0		1	
92=one object per box	0		1	
Nuts and Bolts		0		4
58=washers or nuts on bolts	0		2	
91=cylinders in boards, washers on cylinders	0		2	
Assembly		2		0
80=assembling cardboard boxes	1		0	
87=tops on pens	1		0	
Folding		0		1
88=folding napkins	0		1	
Counting		0		1
81=count cards by 10s, 100s	0		1	
Not identified		1		1
GP Gross Motor Tasks		6		4
Gross Motor		1		0
E=ball play	1		0	

	Standard Activities			
	Preferred		Nonpreferred	
Vestibular		5		3
20=rocking cylinder, boat	2		0	
21=Bobath ball	1		2	
22=vestibular swing	1		0	
30=rocking chair	1		0	
B=tiltboard	0		1	
Exercises		0		1
98=balance on lap	0		1	
MU Music Tasks		3		0
58=record player	3		0	
SN Snack Tasks		1		1
24=chewing	0		1	
25=snack	1		0	
BA Bathroom Tasks (see Daily Living Tasks)		0		0
TOTAL		50		50

Appendixa P

In-service Workshop for Programs Participating in the Self-Injurious Behavior Research Study

The Analysis of Self-Injurious Behavior

Ellen Weinhouse
The Nisonger Center
The Ohio State University
Friday, October 1, 1982
9:00 - 4:00

- 9:00 - 10:30 Overview of Study Findings
  - Prevalence of SIB in the Community
  - Paramaters of SIB (comparison of participants responses on the SIB Perception Questionnaire with study findings)
- 10:30 - 10:45 BREAK
- 10:45 - 11:15 Profiles of Antecedents to SIB
- 11:15 - 12:00 Exercises in the Analysis of SIB
  - Presentation of and Reactions to Mands
    - Example 1 Misunderstanding a behavior request (video)
    - Example 2 Behavior during a difficult task (video)
- 12:00 - 1:00 LUNCH
- 1:00 - 2:15 Exercises in the Analysis of SIB continued
  - Mands continued
    - Example 3 The interaction of errors and commands
    - Example 4 Visual task presentation and SIB (role play)
    - Example 5 Task difficulty and avoidance escalation (video)
  - Physical Contact and Tactile/Kinesthetic Stimuli
    - Example 1 Unexpected kinesthetic input (verbal)
    - Example 2 Unexpected tactile input (verbal)
- 2:15 - 2:30 BREAK
- 2:30 - 4:00 Exercises continued
  - Physical Contact continued
    - Example 3 Unexpected tactile and physical contact that are intentionally directed to child (role play)
    - Example 4 Physical restraint and SIB
  - Visual Stimuli and Related Reactions
    - Example 1 Seeing a person in the room (video)
    - Example 2 Child sees an object he likes (video)
    - Example 3 Distribution of antecedents in the natural environment (written)
    - Example 4 Moving persons and objects away from a blind child (role play)
  - Self-Restraint and Material Restraint
    - Example 1 Effects of physical restraint histories
    - Example 2 Forms of self- restrainz
  - Complex Analysis of SIB